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Sincerely,
Genie Hamlett
Owner

AIDS II: The World Today

Let's review a few facts we know about AIDS:

1. HIV infection is not AIDS.
2. HIV was isolated in West Africa in 1985.
3. Transmission of HIV into the United States may have been through Haiti.
4. HIV is first believed to have originated in the African Green monkey and mankind was infected through the blood of this monkey. A tribe near Rwanda uses the blood of this monkey in special fertility rituals. The blood is drained onto the pubic areas of impotent men or infertile women as a way to treat their infertility. No country wants to be held responsible for the origin of AIDS so various theories abound and the evolutionary beginnings of the HIV virus remains unknown.
5. HIV is not transmitted to humans by biting insects. (Mosquitoes, flies, ticks)
6. HIV is not transmitted through saliva or mucous droplets spread from coughing or sneezing or tears.
7. HIV involves an exchange of body fluids.
8. The body fluids involved in HIV transmission are exchanged during sexual activities, injection drug use in which needles and blood are exchanged, blood which has been donated from an HIV blood donor, and during pre and postnatal events.

The Old Origin of HIV

The oldest documented HIV-1 case is an adult male from Kinshasa, Democratic Republic of Congo in 1959. However, the new genetic information suggests that the virus existed decades prior to that, about 1920-1930. The fact that the two strains of virus from the studied donors,

ZR59 and DRC 60, were opposite-sex adults may suggest that the epidemic was predominantly heterosexual by that time. Recovering these strains with different subtypes suggests that Kinshasa might have been the epicenter for HIV-1-M emergence and spreading. Some scientists proposed parenteral transmissions as the main route, while others suggested urbanization and social changes. Individuals may have become infected thru a variety of sources in Africa to include parenteral transmission, Parenteral is used to describe “direct access to the blood-stream, usually with a needle,” which can be a medically prescribed injection, accidental needle sticks, needles used by drug abuser or contaminated blood given by IV.

A particularly vulnerable site of infection for infants and children is encephalopathy infection which means in the central nervous system (brain and spinal cord). Children which develop HIV may contract it via childbirth or thru parenteral transmission as they are exposed to drugs a parent is using. If children survive into their teen years, the other routes of transmission of HIV become more prevalent and will be discussed in a later portion of the paper.

(Understanding Pathophysiology, pg. 198-200). Therefore, more data are needed to solve the enigma about the origin of HIV (Sousa, 2009).

An Epidemic in Transition

The recent declines in AIDS diagnoses and in deaths among persons with AIDS are encouraging. However, Karon, Fleming, and Steketee’s epidemiologic research (2001) indicated that highly active antiretroviral therapy (HAART) not behavioral change was primarily responsible for these declines. HIV continues to spread among IDUs (Intravenous Drug Users) and via heterosexual and homosexual contacts. Increasing proportions of persons with AIDS are women. The data indicate that the poor are disproportionately affected and that HIV incidence rates are especially high among African American with high-risk behavior. The decline has been mainly due to the slower progression of HIV-associated immune deficiency among persons who

used HAART. However, the declines varied among groups because of differences in HIV testing patterns with African Americans and Hispanics more likely to be tested late in the course of disease; access to and use of effective therapy with African Americans and Hispanics, women, the uninsured, and the poor less likely to have effective therapy; and adherence to therapy.

Overall, during the last 10 years, groups with less access to medical care have been affected more and more by the HIV epidemic. Therefore, monitoring the status of the epidemic and evaluating the effectiveness of prevention programs is an important public health challenge. Karon, Fleming, & Steketee (2001), recommended an expanded HIV/AIDS surveillance program very essential in meeting this challenge.

HIV/AIDS in the Elderly

Greater than 10% of persons with AIDS in the United States are over 50 years of age (CDC uses the age of 50 years as a way of distinguishing older patients), and the number of elderly persons in their 60s and 70s living with HIV/AIDS is increasing. Approximately 75,270 people older than age 50 have been diagnosed with AIDS in the United States (Goodroad, 2003). The national trend indicates that heterosexual and intravenous drug use related transmissions are increasing. Transfusion-related AIDS cases represented 2.9% of diagnoses in older people in 1987 and 2.4% of cases in 1998 which remained constant. Continued transfusion-related HIV cases in older individuals might be associated with the fact that almost 70% of blood transfusions are received by individuals 60 years and older.

Aging is associated with physiological changes. For example, age-associated thymic atrophy (shrinking thymus gland) while does not affect the number of mature CD4 cells, the function of cells is inhibited. Also, CD4 cell regeneration slows with aging. Therefore, older people with HIV are at a greater risk for disease progression. There is an increased risk of autoimmune disorders as one ages as well as increasing risk for HIV associated pulmonary and

renal problems. Older adults with AIDS are more likely to suffer from an organic brain syndrome and social isolation. They often believe illness is a personal matter and asking for help is often perceived as an admission of weakness (Goodroad, 2003)

For What It's Worth

The thymus gland is located approximately 4 - 5 inches below your Adam's apple and releases the hormone thymosin. You can only feel the bone that protects the thymus gland but it's nice to know where it is. The next time you are frustrated by a rude driver or prone to road rage, tap on it 10 to 12 times. This will give you a shot of the hormone thymosin. Some alternative medicine believers think thymosin can calm you down, give you a more positive outlook, and boost your immune system. As you know, since the endocrine system (glands that secrete hormones) works closely with the nervous system to regulate other organs activities, this can produce a response in the body within minutes. It's a good technique to know when it's an all-around "bad day." (Anatomy & Physiology, p. 640, Chang et al, 2009, p. 696)

Several sociological factors affect the perceived risk of HIV in older adults. Three interrelated sets of social factors that act as barriers to recognition of HIV and AIDS in older adults according to Mueller (1997, cited in Goodroad, 2003) are:

- 1) Socially defined meaning of HIV and AIDS—the social definitions of HIV as a disease of gay men and injection drug users have lead to failure in adopting behaviors, such as safer sex and needle exchange for elderly and not considering them at risk for HIV.
- 2) Social response to HIV and AIDS—defining HIV and AIDS as a disease of certain groups or social practices has lead to separating the infected or suspected of being infected and labeling the group as 'them' from "us." The created stigma associated

with HIV has caused older adults not revealing their risk behavior information with health care providers, family, and friends.

- 3) Social organization of health care—Defining HIV as a disease of young people has led to prevention and education programs, including HIV testing being aimed at younger high-risk group. (Goodroad, 2003)

Many older persons with AIDS are less likely to practice safe sex; others may go undiagnosed and therefore untreated due to perceptions that the elderly are not at high risk for HIV infection. Sexual activity do not necessarily decrease with age, it may even increase. In fact, 40% to 65% of older adults between ages 60 and 71 reported being sexually active (Whipple & Scurba, 1996, cited in Goodroad, 2003). National AIDS Behavior Surveys indicated that 8% of the women older than 40 reported sexual activity that could place them at risk for HIV infection; safer-sex practices were rarely reported; almost 95% of the women had not used condoms in the last 6 months; and almost 90% of these risk taking women did not perceive themselves to be at risk. African American and Hispanic women were significantly more likely to report higher levels of risk taking behavior. Primary care physicians may be less likely to suspect HIV when elderly individuals present with symptoms of fatigue, weight loss, or dementia (Zelenetz & Epstein, 1998).

Sexual contact is the main mode of transmission, with sexual transmission as the main risk factor in more than 60% of people over age 50. Atypical presentations of AIDS in elderly create challenges for physicians in correctly identifying HIV infection. The initial presenting complaints can vary from nonspecific symptoms to an AIDS-defining disease. In the elderly, HIV disease may imitate a broad spectrum of neurological disorders. For example, both AIDS dementia and Alzheimer's disease (AD) exhibit impaired memory. However, behavioral changes are a late finding in AD, whereas social withdrawal and apathy is rare in AIDS dementia; aphasia

is rare in AIDS dementia; cerebrospinal fluid studies are normal in patients with AD, but AIDS dementia may show a mildly elevated protein. AIDS dementia is more rapidly progressive but can respond to antiretroviral therapy (Zelenetz & Epstein, 1998). Many other HIV-associated signs and symptoms are similar to those related to aging and associated diseases, such as fatigue, weight loss, chronic pain, and anorexia (Manfredi, 2002).

Elders with HIV face many of the same stigmas as younger individuals with the disease, for example: stigma and discrimination, loss of trust with the loved one, and lack of support and understanding from family and friends. Older individuals are more frequently hospitalized than younger person with AIDS. As age increases, the mortality rate increases. Thus, both the clinical course and outcome of HIV-associated disorders are influenced by advanced age. Malnutrition in the elderly compromises immune function which contributes to a poor prognosis. Nutrition that is less than the body needs for daily functioning can be related to several problems. Some elderly simply do not eat enough because of social isolation. Eating is a social event and people eat more when with others. Other causative factors are depression, finances, or the inability to prepare food due to physical limitations (arthritis). The elderly may have illnesses or wounds which require an increase in protein (meat, eggs, and beans) and vitamins (E, C, Folic acid, calcium) in order to heal. They may be taking medicines with the side effect of inadequate absorption in the intestines. (Neomycin, antacids) They may have tooth decay, periodontal disease, no teeth, ill fitting dentures or mouth ulcers that limit their ability to eat many foods. They may have nausea related to chemotherapy or radiation treatments. They may have trouble swallowing due to Parkinson's disease, strokes or Huntingdon's disease. They may have cirrhosis of the liver or impaired digestion due to pancreatitis both of which may produce diarrhea and impaired vitamin storage. (Handbook of Nursing Diagnosis, p. 296-298) Another challenge is the choice of antiretroviral therapy for the elderly. There are several reasons for this

including altered pharmacodynamics which affects drug levels and can increase drug toxicity (Zelenetz & Epstein, 1998). Concurrent kidney or liver diseases deserve special attention when potentially nephrotoxic (e.g., indinavir) or hepatotoxic agents (e.g., protease inhibitor and non-nucleoside reverse transcriptase inhibitors) are used (Manfredi, 2002).

Kidney Disease in Person with HIV/AIDS

HIV-infected individuals are facing the challenges of an aging population with associated conditions due to the effects of longstanding HIV infection and Highly Active Antiretroviral Therapy. The incidence of HIV associated nephropathy has remained constant since the mid-1990s. However, the prevalence of kidney disease appears to be increasing in this population. Abnormal kidney function is seen in up to 30% of HIV-infected population. Patients with HIV are susceptible to both acute and chronic kidney disease. In order to manage kidney disease appropriately we need to understand the clinical presentation and the risk factors (Fine & Atta, 2007).

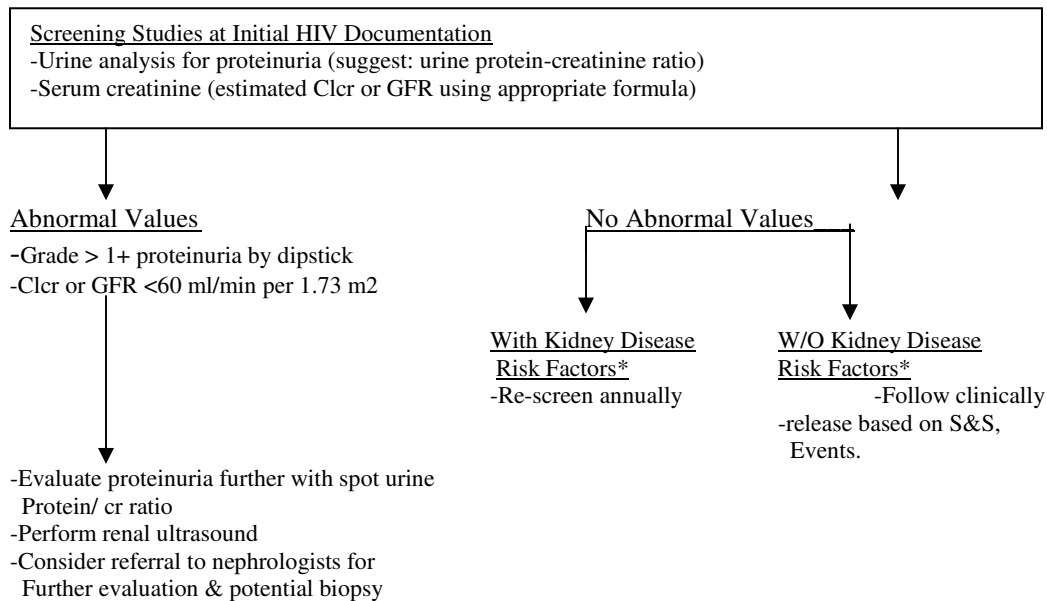
Acute renal failure (ARF) is frequent in patients with HIV. Drug-related toxicities include tubular disorders (due to the drug tenofovir), interstitial nephritis (due to a variety of drugs), and kidney stones (due to the drug indinavir). If the diagnosis is not obvious a kidney biopsy needs to be performed. HIV-associated kidney disease rapidly progresses to end-stage renal disease (ESRD). This can occur over the course of weeks to months. HIV-associated kidney disease occurs almost exclusively in patients of African descent. Patients usually have a rapidly increasing creatinine level, proteinuria over 3 grams, and a detectable viral load. For early identification and improved outcomes, risk factor assessment and screening should begin at the first provider contact at which HIV infection is documented. (Figure 1)

Kidney Disease Risk: Assessment

-Race

-Family history of kidney disease

- CD4+ lymphocyte count
- HIV-1 RNA level
- Nephrotoxic medication use (history)
- Cocaine use (history)
- Smoking (history)
- COMORBIDITIES
 - Diabetes mellitus
 - Hypertension
 - Hepatitis C co-infection
 - Atherosclerotic vascular disease



Risk Factors include*:

- African Americans
- Patients with CD4+ count <200 cells/mm³
- Patient with RNA levels <4000 copies/ml
- Patients with diabetes, hypertension, cocaine addiction, atherosclerotic vascular disease, hepatitis C co-infection

Fig 1. Infectious Diseases Society of America (IDSA) guidelines screening for HIV-related renal diseases. (cited in Fine & Atta, 2007)

In summary, the prevalence of kidney disease is increasing in the aging HIV-infected population. This is associated with frequent other illnesses that place them at higher risk. Therefore, it is imperative to use appropriate diagnostic and screening methods for earlier diagnosis and better management and outcomes.

Liver Damage in HCV-HIV Patients

One of the leading causes of illness and mortality in patients with HIV is progressive chronic liver disease associated with hepatitis C. Hepatitis C virus (HCV) and HIV are both RNA viruses that share common routes of transmission. It has been estimated that 25–30% of HIV-infected individuals are co-infected with HCV, while certain subpopulations (injection drug users and individuals with hemophilia) the prevalence may be >90% (Lee & Dieterich, 2004). The reasons for accelerated course of HIV/HCV co-infection are mainly due to: 1) the persistence of HCV, which depends on alterations of cell-mediated immunity, and 2) the activation of the immune system towards secretion of pro-inflammatory and pro-fibrotic cytokines. Early containment of HIV-1 or clearance of HCV infection is associated with induction of strong CD4 and CD8 T-cell responses (Bruno et al., 2008).

Hepatic liver fibrosis (hardening) is the result of the wound healing response of the liver to repeated injury. Hardening of the liver in HIV/HCV patients is a more complex process than infecting with only one virus. This is due to interplay of immunologic, viral, and exogenous factors. Probably, the best way to control the disease is by treating both infections and also managing oxidative stress (Bruno et al., 2008). HAART in the setting of HCV infection also requires some special consideration, namely an increased incidence of the liver becoming toxic. Treatment of co-infected patients requires close monitoring as current therapies are not ideal in terms of effectiveness, and toxicity may be severe.

Central Nervous System (CNS) Complications of AIDS

When it was first identified in Africa, AIDS was known as “slim disease.” This is because of debilitating clinical course of AIDS. Approximately one-third of all patients with AIDS eventually develop neurologic complications. Neurological symptoms are frequently headache, dementia, confusion, and decreased memory. Presentation is often due to symptoms of secondary infections such as *Pneumocystis carinii* pneumonia or candidiasis involving the throat

or esophagus that does not clear after appropriate therapy. Sinusitis may also be part of the cranial presentation of AIDS. Both the systemic and CNS infections contracted by AIDS patients are usually not bacterial in origin, but are caused by opportunistic infections. Neuroimaging techniques such as CT and MR are critical to the detection and diagnosis of CNS complications (Ramsey & Geremia, 1988).

One Central Nervous System complication particularly visible early in the HIV process of deterioration is muscle dysfunction. The CNS controls how the body moves. When the brain and spinal cord are infected with the HIV virus, changes in muscle tone, simple movement and complex, coordinated movements are affected. An HIV sufferer may begin to show a range of abnormal movements; flaccid muscle tone or ataxia/tremor with weakness or exaggerated, over reactive reflexes. The patients gait may begin to lose its smooth constant, coordinated, rhythmic pattern. Leg swing is no longer even on both sides or there is a jerking motion when taking a step forward. Managing doors or stairs becomes impossible early on. Muscles may become firm or tense throughout any movement. The patient becomes weak and easily tired. He may have difficulty rising from a chair without arm support due to leg weakness or trouble sitting down due to rigidity. Because of this dichotomy, muscles which are too flaccid and weak at some times and muscles with normal muscle tone which fail to cooperate by becoming hard and jerky at other times, the patient can never be sure of what activity he is able to perform on a particular day. Accidents during self-care and walking are common at this time. As input from the motor neurons decrease, joints become hyper-flexible. This may result in a patient having extreme joint mobility. The patient may look like a “puppet on a string” with loose joints and pendulous knee jerks. As the muscle atrophies (deteriorates) because of the continued decrease in stimulation from motor nerves, the muscles appear flabby and flat. Muscle fibers, one by one, gradually die. As the skeletal muscles framework of fibers weaken muscles which are supported

by tendons (tendons connect to bones) droop. Ligaments (bands that connect bones to joints) together with tendons not only support the bones and joints but facilitate motion. As this entire framework deteriorates tendons tear (a strain) and ligaments tear (a sprain) or they may separate from the bone. All are painful, accompanied by swelling, and eventually result in the dislocation of bones. Muscles, tendons and ligaments receive electrical input from motor nerves but as the nerves become more and more damaged by the HIV virus, the entire unit, which controls voluntary movement, eventually shuts down. Skeletal muscles deteriorate first. Since these muscles constitute 40% of an adults weight it is easy to understand why an AIDS victim begins to look “hollow” in his face, frail and wasted. Since 32% of all protein stored, for energy and metabolism, is stored in muscle, extreme weakness is to be expected.

Let's be sure we have a full understanding of the level of pain we are referring to when there are torn tendons or ligaments and dislocated bones. The pain is sharp and localized in the area of the bone. Tenderness persists over the tendon or ligament. This is a very unique pain. Anyone who has experienced tennis elbow knows of the ache and persistent sharp pain caused by the inflammation of the tendon where it attaches to the bone (the epicondyle – area of attachment). Other areas where epicondyle inflammation occurs are the humerus (upper arm) radius (outside elbow), ulna (inside elbow), around the knee or the heel (Achilles tendon). In addition to inflammation and tearing of the tendons and ligaments, evidence shows that calcium collagen forms causing additional pain. Tiny tears cause bleeding and edema, which increases pressure, causing the area to become engorged. All of this is happening below the surface in areas that are not visible to the caregiver. It is hard to visualize the damage in the muscles, bones, tendons and ligaments but rough handling during transfer or ADLS can cause excruciating pain. It is the staff members' responsibility to:

- Dispense pain medications as ordered prior to moving the patient.

- Keep the patient and especially the joints warm.
- Handle gently and slowly.
- Forewarn the patient when a body part is about to be moved.
- Use slings or pillows for support.

Remember that the simple weight of a limp extremity pulling down can generate enough pressure to reduce the oxygen flow to the muscle resulting in edema (swelling – fluid accumulation). The patients’ arms and hands, which are unable to move, must be kept in slings or propped to prevent the additional painful occurrence.

The most common neurologic manifestations are minor cognitive and motor disorder and HIV-associated dementia. The most common psychiatric manifestations are depressive disorders. HIV virus can be isolated from the cerebrospinal fluid (CSF) and can also be found in brain tissue. This suggests that the virus can cross the blood-brain barrier. HIV crosses the blood-brain barrier by a Trojan-horse-type mechanism using macrophages it infects (Dube et al., 2005). People with severe neurocognitive deficits usually have higher plasma HIV viral load. Neurocognitive deficits are manifestations of both direct and indirect effects of HIV on the CNS. The most common neurocognitive deficit is psychomotor retardation. Psychiatric symptoms associated with HIV disease often go unrecognized because it can be complicated by the complex biologic, psychologic, and social circumstances (Dube et al., 2005).

Challenges in Pain Management among Persons with AIDS

“Pain is often called the fifth vital sign and can reveal a lot about the health status of a person” (Nair et al., 2009). Pain can affect quality of life by affecting one’s mood, activity, appetite, sleep, and self-care. It is a subjective experience and is one the most frequent symptoms

in AIDS patients at all stages of disease, especially in the advanced stages. The prevalence of pain in HIV patients is between 30%-80% which is frequently under estimated by physicians. Inadequate assessment of pain leads to inadequate management of pain (Nair et al., 2009).

Management of Pain

Patients suffering from chronic pain relating to the musculoskeletal changes described, generally try to keep pain related behavior to a minimum so they appear as normal as possible. The desire to relieve pain and the need to hide it are constantly conflicting. The AIDS patient struggles to avoid being labeled as a constant complainer. Constant pain changes normal sleep patterns to sleeplessness; an upbeat personality to depression.

The best way to deal with the constant attention that never ceasing pain provoking stimuli can demand is to identify the type of pain and to treat it. There is no need to force the patient into a state of hiding pain. This can only lead to his experiencing a sense of hopelessness and helplessness when no relief seems possible. There are two principles to follow in the treatment of pain:

- I. Treat Each Patient's Pain Individually.**
- II. Give as much pain medication as is necessary to control the pain.**

Consider this.....

If these two principles are followed in the treatment of other conditions; for example, High Blood Pressure, why are we reluctant to treat an AIDS patient for pain? Follow the example below for the treatment of High Blood Pressure.

- I. We treat each patient individually.**
 - a) We assess the level of BP and how high BP makes the patient feel.
 - b) We assess the time of day it increases. Do high salt foods affect it?
 - c) We assess if a diuretic (Lasiz 10 mg per day) lowers the blood pressure.

d) We assess if the patient feels better; has more energy; fewer headaches.

III. We give as much blood pressure medicine as necessary to control the blood pressure.

a) We assess the level of blood pressure and if it is not under control with Lasix, we add another medicine, possibly Disiroptic (10 mg. per day)

b) We assess the BO readings several times a day. If the BP is not under control, we use stronger meds or we increase the dose of 1 or both medications.

c) Determination is made regarding how the patient is feeling; if they are uncomfortable, side effects, etc. If so, the medications are changed until the patient is comfortable.

This is common sense. This is pharmacologic common sense. However, what is common sense in the management of hypertension, diabetes or allergies is regarded as “dangerous” in pain management. Patients who use too many NSAIDS (aspirin, Advil, naproxen, Motrin) are at greater risk for internal bleeding, liver failure and stomach ulcers as side effects than patients taking narcotics. Respiratory depression occurs rarely and there are “flashing” warning signs. NSAIDS are silent killers. However, because patients in pain are undertreated, they often overuse the NSAID group of pain medications, taking more than 3000 mg. a day. They could use a much safer dose of 60 mg. a day of an opioid (common name for a narcotic), such as, Percocet, Darvon, fentanyl or oxycodone. Within the NSAID group and the opioid group are a variety of drugs from which to select. The specific meds chosen obviously depend on a number of considerations, particularly the type pain being treated and the patient’s medical condition. The main principle is to balance the pain meds so that pain is treated in advance of its increasing to an intolerable level. “Pre-emptive” pain management is the key so that continuous pain management is achieved. No break through pain is the goal.

Let's return to our two basic principles of the treatment of any disease and think about it in terms of displaced bones, torn ligaments and the swollen joints in AIDS patients.

II. We treat each patient's pain individually.

- a) We assess the level of pain the patient is experience and even the potential for pain if he/she will not or is not able to express pain.
- b) We determine if time of day, activity, foods, and temperature . . . increase/decrease the pain.
- c) We assess if Tylenol (250 mg. 4x's daily) is helping the pain and if it makes the patient feel better (i.e. less moaning, less clutching injured limb, more able to initiate movement)

II. We give as much pain medication as is necessary to control the pain.

- a) We assess the pain level and if it is not under-control with Tylenol (250 mg.4x's a day), we add an opioid. This combination is very effective! A non-opioid (any of the NSAIDS) with an opioid (oxycodone, fentanyl, morphine, etc) works very well for even severe pain. The amount given is increase by 25% increments until an effective dose is reached. This dosing can be increased many times over weeks/ month/years as needed.

Our AIDS patient may receive Tylenol (250 mg, 4x's a day and 50 mg. of morphine every 4 hours round the clock and receive complete pain relief with no return of the pain between doses. He is able to get up in a wheelchair and move around, feels like eating, and can now sleep. His depression lifts and he has hope for enjoying each day.

To determine the prevalence, incidence, and characteristics of pain connected with AIDS, Frich and Borgbjerg (2000) conducted a prospective longitudinal study and interviewed patients

every six months during a 2-year period or until death. The overall incidence of pain was 88%, and 69% of the patients suffered from constant pain interfering with daily living to a degree described as moderate or severe. The most common pain localizations were: extremities (32%), head (24%), upper gastrointestinal tract (23%) and lower gastrointestinal tract (22%). Pain conditions were connected to various opportunistic infections, Kaposi's sarcoma, or lymphoma. Pain in the extremities was predominantly of neuropathic origin (21%). The number of pain localizations increased significantly as death approached. The survival rate for patients without pain at entry was significantly higher than the survival rate of patients in pain. Sustained-release morphine preparations were prescribed in 29% of the patients. According to the Pain Management Index (PMI), the patients were insufficiently treated at the beginning of the study. Patients were reluctant to take analgesics, primarily because of fear of addiction.

Nosocomial HIV Infection

In Greek, *nosos* means disease and *komein* means to care for. Nosocomial infections are defined as “Those that originate or occur in a hospital or hospital like setting more than 48-72 hours after admission, and that were not present or incubating when the patient was admitted” (Ganczak & Barss, 2008, p. 48). Healthcare-associated HIV infections are frequently associated with hospital admission. Such infections can also be associated with admissions to any healthcare facility. HIV can be transmitted to patients and to donors of blood products by contaminated needles or surgical instruments, medical equipments for example during dialysis, blood transfusion, organ transplantation, and artificial insemination. Healthcare workers (HCW) can be infected by occupational exposures to hazardous materials such as blood contaminated sharps. Chronic hemodialysis has been associated with a risk of patient-to-patient and patient-to-staff transmission of HIV. Transmission of HIV from infected HCWs is possible by contact when a worker sustains a needle stick or other injury from a sharp device. There are several

occupational risk factors for HCWs HIV acquisition: 1) prevalence of HIV among patients, 2) the efficiency of virus transmission after a single contact with blood, and 3) the nature and frequency of occupational contacts with blood (Ganczak & Barss, 2008).

The best approach to prevent nosocomial infection is to include the application of standard precautions. In the United States, the use of safety engineered devices was mandated by the Needle stick Safety and Prevention Act of 2000. While there is general acceptance among HCWs of the need for standard precautions for control of nosocomial HIV infections, there are also high levels of fear of occupationally acquired HIV observed among nurses and doctors (Ganczak & Barss, 2008). In the next section we briefly will discuss AIDS knowledge and attitudes among nursing home staff.

AIDS Knowledge and Attitudes among Nursing Home Staff

The general public is already expected to be aware of the basic facts about AIDS due to publicity in the popular media about HIV. Nursing home staff usually receives additional training on these topics to further their levels of understanding and clinical confidence. Selbst and Alves (1994) examined AIDS knowledge and attitudes among nursing home staff. The data indicated that:

-7.5% of the respondents reported receiving no on-the-job training about HIV/AIDS.

-92.5% of the respondents got information about HIV/AIDS from newspapers and magazines; 82.5% from radio and TV; 58.3% from professional journals; 35.8% from professional seminars; and 1.6% from churches.

-55% of staff indicated that their values in confronting AIDS may be shaped or influenced by values of their families.

-Respondents categorized the persons at greatest risk for contracting HIV, in descending order of: surgeons, dentists, laboratory technicians, nurses, and housekeeping, food service, and maintenance workers.

-11.7% stated that training would not be effective in preventing the spread of HIV in their facility.

-28.3% of the respondents preferred that residents with AIDS be placed in a separate unit.

-33.3%, a sizeable minority, were not willing to care for person with HIV/AIDS even with precautions.

-50% of the respondents were not willing to work in a specialized AIDS unit.

-50% of nurses and laboratory technicians and about 75% of CNAs said they would consider leaving health care if more residents with HIV/AIDS were admitted because of the growing epidemic.

The researchers concluding remark indicated that “The finding raises questions as to the completeness, accuracy, and consistency of information conveyed to the staff...improved training and monitoring may contribute to greater confidence among workers to the value of training and the efficacy of precautions” (Selbst and Alves, 1994, p. 5).

This study shows that persons with AIDS (PWAs) are experiencing prejudice. AIDS-related stigma has enormous negative impact on their access to resources, psychological well-being, and HIV-related health promotion. With the increased use of antiretroviral therapy, more patients with HIV/AIDS are surviving for long periods of time. Therefore HIV-related morbidity and mortality have reduced but associated stigma and discrimination persist. Partly, this could be related to the cultural taboos of sex and drug use as causes of viral transmission. Living longer does not mean that persons with AIDS are well and living full lives.

Few nursing homes in the United States provide specialty care for PWAs. Many refused admitting these patients in the early part of the epidemic. Hughes, Davies, & Gudmundsdottir (2008) explored the meaning of dignity and the lived experiences of the urban poor with advanced HIV disease receiving care in an AIDS-dedicated nursing home unit. The findings point out the most important indicator of quality of life for the participants which are dignity and respect. “Respectful care contributed to the quality of care” (p.12). Dignity was violated when participants felt spoke down to, requests were ignored, and hygiene needs were not addressed in a timely fashion. Also, racism, oppression, homelessness, poverty, trauma-filled lives, substance abuse, fragile support systems, and criminal histories, and the unit’s confinement were some of the everyday indignities that participants experienced. The data emphasizes “the need to develop programs that meaningfully bridge racial and ethnic differences between nursing home staff and patients to facilitate mutual understanding” (p. 13).

To reduce AIDS-related stigma theory- and evidence-based health promotion interventions are needed. What follows include a few examples of such interventions.

Health promotion is a planned activity that includes four major phases:

- 1) Diagnosis—based on conducting a needs assessment; analyses of behavioral and environmental causes; taking into consideration the economic and cultural context; and the resources of the community.
- 2) Development—defining objectives for their interventions based on the needs assessment; identifying theory-based strategies to accomplish the objectives; and identifying the optimal intervention for a particular problem, target population and intervention context.
- 3) Implementation—plan and design a strategy to facilitate program adoption; to support program implementation; and to encourage program maintenance.

- 4) Evaluation—evaluating the impact of the interventions on psychosocial, behavioral, and environmental conditions; on health; and on quality of life outcomes. (Bos, Schaalma, & Pryor, 2008)

AIDS-related Stigmatization

“A stigma is an attribute or characteristic of a person that is deeply discrediting and calls into question the full humanity of this person” (Bos, Schaalma, & Pryor, 2008, p. 452). This is based on the perception of people of that condition. There are four different perceptions leading to stigmatization related to PWAs:

- 1) Perceived contagiousness—people respond with fear and social rejection.
- 2) Perceived seriousness—people respond negatively because of its association with death.
- 3) Personal responsibility—people respond with less pity and stronger anger.
- 4) Norm-violating behavior—for example homosexual intercourse and injection drug use which may evoke negative emotions in people. (Bos, Schaalma, & Pryor, 2008)

Bos, Schaalma, and Pryor (2008) suggest that the provision of information together with skills building is more effective than only the provision of information. Also, personal contact with persons with AIDS is one of the important approaches to reduce the stigma.

The Challenges of Providing Long-Term Care for HIV/AIDS Patients

Acquired Immune Deficiency Syndrome is now viewed as a chronic disease requiring long-term management. As a result, more persons with PWAs are seeking long-term care in facilities that have primarily served the elderly. Therefore, competition for limited long-term care resources may develop between the frail elderly and PWAs. The nursing home industry has raised many issues regarding the feasibility of admitting AIDS patients as residents, but little is known about how important these issues are in deciding admissions policy. How the industry

perceives and resolves the concerns it has regarding delivery of care to PWAs can affect the overall long-term care system and thus affect the traditional users-the frail elderly. A survey of 250 nursing home administrators in the five highest AIDS-incidence areas in the United States was conducted to identify the important admissions policy issues (Fogarty, Gentry, and Lehrman, 1997). The findings identified several issues including: the ability to meet special care needs, costs of care, and inadequate reimbursement. The majority also believed the most appropriate methods of providing care were special care units for AIDS within nursing homes or dedicated HIV/AIDS nursing facilities.

It has been noted that an increasing proportion of older Americans are being diagnosed with HIV. A survey by the Catholic Health Association stated that a major concern of its affiliated long-term care facilities is how to deal with the increasing number of AIDS patients it treats (cited in Pearson & Hueston, 2004). Those with HIV/AIDS requiring care in rural areas are steadily increasing in number. At the same time, the ability to provide services to these individuals in their rural setting is limited. Functional and cognitive impairments associated with old age may be the reason a person initially seeks long-term care services. Those reasons could be complicated with an HIV/AIDS diagnosis as well. Study by Pearson and Hueston (2004) showed that less than 1% of both urban and rural nursing homes indicated that they offered specialty HIV/AIDS care. This can be explained by the lack of any financial incentives for the facility to provide these services. A larger proportion of facilities with smaller numbers of beds are located in rural areas. Data from the same study indicate that there is currently no difference between rural and urban nursing homes in the availability of HIV/AIDS-related services (Pearson & Hueston, 2004).

As it was mentioned earlier, utilization patterns of health care services among individuals with HIV/AIDS have been greatly altered by advances in treatments and improvements in health

care delivery system. In the early years of the epidemic, individuals were frequently diagnosed late and primarily received palliative, in-hospital care. Today, individuals with HIV can expect to live long similar to people with other chronic disease. Therefore, HIV/AIDS patients will have increasing needs for nursing home care. In addition, demographic composition of the HIV/AIDS population is changing which can affect use of services. The epidemic is rapidly spreading among women, persons of color, and intravenous drug users who tend to be financially and socially disadvantaged (Uphold & Mkanta, 2005).

The advent of HAART caused health care costs and in-hospital admissions to decrease. However, there has been an increase in rates of hospitalizations as a result of patients increasingly developing resistance to antiretroviral medications, a growing incidence of chronic co-morbidities, and side effects of HAART. These trends have important implications for practice and policy (Uphold & Mkanta, 2005).

Skilled nursing facility (SNF) care for person with HIV/AIDS will likely grow. SNF are becoming accepted parts of an AIDS continuum of care. Persons with HIV/AIDS are generally thought to be costlier than traditional nursing home patients. Swan, Benjamin, and Brown (1992) compared average daily hours of care for patients with and without AIDS in a hospital-based SNF. The data showed that PWAs received about 20% more nursing time than did other SNF patients. Patients with AIDS averaged over an hour more direct nursing care per patient day.

Effects of Psychosocial Support on HIV/AIDS Progression

“As people living with HIV thrive, as a result of advancements in medication, the link between social support and chronic illness becomes more salient” (Ashton et al., 2005, p. 588). Social support plays a major role in the lives of HIV patients. Better social support is related to slower rate of decrease of CD4+ cell count, slower progression to AIDS, and longer survival. Therefore, understanding how individuals cope with HIV/AIDS is essential to the development

of effective interventions. Ashton et al., (2005) conducted a study to test relationships between social support and use of three maladaptive coping strategies: behavioral disengagement, mental disengagement, and venting, with change in the number of HIV-related physical health symptoms. Of the three measures, only venting predicted a greater increase in the number of HIV health symptoms experienced. This also supports other research that found that HIV-positive patients who attended support groups reported less emotional distress. This and growing number of studies suggest that interventions to improve social support and coping strategies can promote better health in patients with HIV/AIDS.

Nutritional Management

Since the introduction of highly active antiretroviral therapy (HAART) which has resulted in improved survival time, nutritional management of individuals with HIV/AIDS has become increasingly complex. Since the early stages of epidemic, weight loss was the major nutritional issue in these patients. Several studies have demonstrated that even small weight losses (5%-10%) in patients with HIV/AIDS are associated with an increased risk of morbidity and mortality. A weight loss of greater than 10% of usual body weight as well as either chronic diarrhea (at least two stools per day for 30 days or more) or chronic weakness and fever (for 30 days or more) plus an HIV-positive diagnosis is defined as HIV wasting syndrome. The cause of weight loss in people with HIV/AIDS is usually multifactorial. These include presence of secondary infection and decreased energy intake, malabsorption, and metabolic abnormalities (Batterham, Brown, & Garsia, 2001).

After introduction of HAART, its side effects lipodystrophy (loss of subcutaneous peripheral fat loss and/or visceral adiposity) have become the major issue. This syndrome often accompanied by hyperlipidemia and insulin resistance in patients taking HAART. Side effects of HAART particularly diarrhea and nausea are common. Gastrointestinal and systemic side effects

resulting from HAART therapy are a leading cause of discontinuation of protease inhibitor therapy. Early in the course of untreated HIV infection HDL concentration decrease which is a risk factor for cardiovascular disease. As HIV infection progresses, the LDL particles, the small and dense type increases cardiovascular risk. In addition treatment with protease inhibitors increases triglyceride concentrations (Batterham, Brown, & Garsia, 2001).

Drug treatment for older adults with HIV disease can be complicated. This requires significant life planning related to meals and fluid consumption. In addition to treating HIV infection itself, the associated conditions may require medications too (e.g., diabetes, hypertension, hyperlipidemia). Therefore, polypharmacy becomes a significant concern. This may increase risk for adverse drug reactions, drug interactions, and difficulties with adherence (Goodroad, 2003).

Due to the side effects of HAART and life style changes necessary to take this treatment, some people may choose not to take this treatment. Dietary counseling should be implemented as the first line of management for people with HIV-associated weight loss. Nandrolone decanoate (a testosterone analogue) and testosterone are often prescribed for treating HIV-associated weight loss. Although other treatable causes of weight loss should be excluded and dietary counseling be tried first. Megestrol (a synthetic progesterone analogue) is an effective appetite and weight promoting agent in people with HIV/AIDS. Intensive nutritional intervention is recommended early in the course of HIV infection. When weight loss has occurred, nutritional intervention with or without oral supplementation, enteral-nasogastric nutrition, percutaneous endoscopic gastrostomy nutrition, and parenteral nutrition should be employed to increasing weight and improving body composition (Brown & Batterham, 2001). In patients with newly diagnosed HIV infection, the initial emphasis should be on counseling with regard to the disease

process, limiting the risk of secondary transmission, ensuring that there is proper support for the patient, and building a trusting relationship between the patient and the caregiver.

In addition, non-pharmacologic approaches such as moderate physical activity (three to four times a week) may slow HIV disease progression. Diet and exercise have also been suggested as the first line of treatment for management of hyperlipidemia in those who are receiving HAART. For dietitians working with patients with HIV/AIDS, knowledge of current nutritional issues is essential to provide appropriate nutrition education and support (Brown & Batterham, 2001).

Micronutrient supplements have been proposed as low-cost immunomodulating interventions that may slow the progression of HIV disease. In Fawzi et al.'s (2004) study, supplementation with multivitamins:

- reduced the incidence of complications including oral thrush, oral ulcers, and difficulty in swallowing.
- nausea, vomiting, and diarrhea were also less frequent.
- significantly higher CD4+, CD8+, and CD3+ cell counts and lower viral load.
- reduction in HIV replication and significant reduction in viral load.

A substantial use of complementary and alternative medicine (CAM) has been reported by persons with HIV/AIDS. Alternative therapy has been defined as “therapy not generally provided by most conventional clinics and hospitals...an unorthodox, non-Western, or non allopathic medical practice” (Chang et al., 2003, p. 696). Complementary therapy used in AIDS has included traditional healing practices (e.g., acupuncture), chiropractic, homeopathic, herbs, relaxation, and religion. Protease Inhibitors therapy generally is associated with significant side-effects. Some patients often self-manage the side-effects with the use of complimentary therapy.

Figure 2 represents determinants of self-care in using complementary therapy use in people living with HIV/AIDS undergoing antiretroviral therapy.

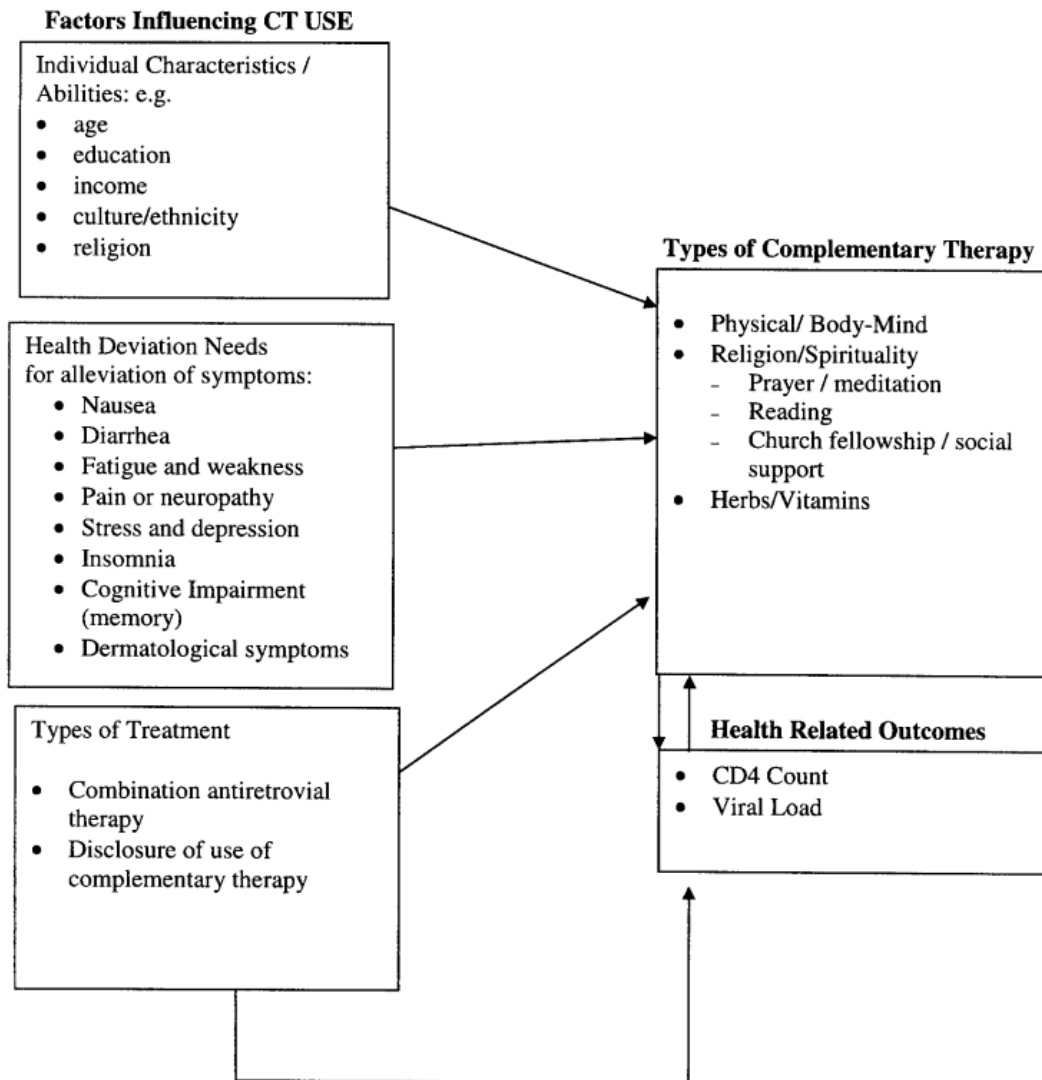


Fig. 2. Determinants of self-care in using complementary therapy use in people living with HIV/AIDS undergoing antiretroviral therapy. (Chang et al., 2003)

As Figure 2 shows, the most common symptoms reported by HIV/AIDS patients included fatigue, nausea, diarrhea, stress, depression, pain, and memory problems. In one study (Duggan et al., 2001 cited in Chang et al. 2003) exercise was a major form of complementary therapy. The patients used exercise to reduce stress and enhance immune function. In addition, prayer was found to be the most commonly used spiritual component for people with HIV/AIDS.

While a substantial proportion of people with HIV/AIDS use complementary therapy, most physicians do not routinely discuss complementary therapies with their patients.

Recently, warnings have been issued about the case of some complementary therapies: St. John's Wort and garlic supplements. They may decrease blood levels of some protease inhibitors and nucleoside reverse transcriptase inhibitors. Chang et al.'s study demonstrated that complementary therapy use was associated with higher education, being Christian, Caucasians and African Americans, and working part or full time. In this study, significantly more patients with HIV/AIDS with symptoms used physical/body-mind therapies than those without symptoms. The use of herbs and supplements was significantly associated with the use of protease inhibitors. And, among the categories of complementary therapy, religion, especially prayers, were most frequently used.

Effects of Exercise on Patients with HIV/AIDS

The role of physical therapy in patients with HIV/AIDS is to maximizing the patient's independence, minimizing the disability, and increasing the patient's functional status. Consequently, the role of the physical therapy is to improve patient's quality of life. In general, exercise, especially if introduced early in the course of infection in those with HIV can increase CD4 level and can fight off against opportunistic infections. However, heavy/exhaustive exercise or exercise for 90 minutes or longer should be avoided in individuals with HIV/AIDS due to immunosuppressive effects and temporary depletion of T-cells. This also occurs in healthy individuals and it takes anywhere from 3 to 72 hours to return to previous state. Exercise training is contraindicated during rapid weight loss or an active opportunistic infection (Anderson, 2006).

One of the hallmarks of AIDS is wasting syndrome. Progressive resistive exercise (PRE) can prevent weight loss, maintain a desirable adipose/lean tissue ratio, and restore body weight and muscle mass. The exercise program should promote an individual and balanced program

designed to increase aerobic capacity, muscle function, flexibility, and functional ability. For patients with HIV/AIDS a moderate aerobic exercise should be recommended, which is defined as 60% to 70% of maximum heart rate (220 - age). Exercise recommendations for patients with HIV/AIDS are depicted in Fig. 3. (Anderson, 2006)

Stage 1 Asymptomatic CD-4>500/ mm³	Stage 2 Symptomatic CD-4=200-500/mm³	Stage 3 AIDS CD-4 < 200/mm³
Start exercise regimen as early as possible. Promote consistency. No limitations for most individuals.	Possibly reduced exercise capacity due to a decreased VO_{2max} , O_2 pulse max, elevated heart rate, elevated breathing, and reduced vital capacity. ²	Even further reduced exercise capacity due to a decreased VO_{2max} , O_2 pulse max, elevated heart rate, elevated breathing, and reduced vital capacity. ²
*Moderate aerobic exercise and **PRE combined. ¹⁶	*Moderate aerobic exercise and **PRE combined. ¹⁶	Individuals should still remain physically active, but continue exercise on a symptom limited basis, *moderate aerobic exercise and **PRE combined, as tolerated. ¹⁶
***Heavy aerobic exercise should be avoided. Individuals should stop exercising during acute illness or rapid weight loss.	***Heavy aerobic exercise should be avoided. Individuals should stop exercising during acute illness or rapid weight loss.	***Heavy aerobic exercise should be avoided. Individuals should stop exercising during acute illness or rapid weight loss.
*Moderate aerobic exercise is 60-70% of maximum heart rate (220-age) or 45-55% of VO_{2max} for 20-30 minutes (excludes warm-up and cool-down) three to five days per week. ¹⁰ **Progressive resistive exercise (PRE) defined as 3x/week ²² while starting with 1 set of 8-12 reps for all major muscle groups, increasing to 2 sets, and adding weight as needed to reach repetition maximum at 8-12 reps. ¹¹ ***Heavy aerobic exercise should be avoided at all three stages, and can be defined as 70-85% of maximum heart rate or 55-70% of VO_{2max} . ¹⁰		

Fig 3. Exercise recommendations for patients with HIV/AIDS (Anderson, 2006)

Positive associations between adaptation to HIV disease and exercise, special diets, and the perception of physical, emotional, and spiritual health have been established. Research shows that aerobic exercise benefits psychologic and immunologic functioning and progressive resistance exercise improves strength, power and endurance of individuals with HIV/AIDS (Galantino et al., 2005).

T'ai chi is a form of light resistance exercise. This can be performed by patients who are unable to participate in more active programs. T'ai chi improves balance thus helping prevent

falls. It also has cardiovascular benefits. T'ai chi is usually practiced as group exercise. Studies support the positive effects of group therapy on psychological variables such as mood, adjustment, and pain. Group intervention provides a socialization context for management of chronic HIV disease. Other physical and psychological effects of T'ai chi are on respiratory function, flexibility, immune system, and joint and muscular strength. Galantino et al's study (2005) indicated that T'ai chi and aerobic exercise improve physiologic parameters, functional outcomes, and quality of life.

HIV/AIDS in the United States and the World Today

Health care professionals are forced to be concerned about a variety of sexually transmitted diseases, the most deadly being HIV/AIDS. In the world and the U.S., twenty-five years ago, AIDS was known to be a disease contracted by gay men. It reached its peak in the 1980's. It then became known as a disease which affected drug users. Since 2006, it has gained the reputation of being a homosexual and heterosexual disease. (NIH, June 2006) Now, it affects men, women, and infants.

HIV is known as a "Retro Virus." It is unusual in that it has the ability to push its RNA into a host cell and then uses the host cell's ability to reproduce and to turn its RNA into DNA. Then it forces the host cell to make millions of HIV virus cells. The genius of the HIV virus is that this virus works using its RNA to make DNA (it is usually the opposite) and the fact that it has the ability to hide inside the host's cells incognito and undetected by the body's immune system. This ingenious way of working inside the human body is why HIV/AIDS is the incurable disease it is today. (Ward, 216-221)

The cells, which the virus chooses as the site for multiplying, are the host's T-cells. HIV has three stages. The immune system slowly deteriorates as the HIV virus multiplies inside

T- cells. As the immune system weakens, there is a long term progression of diseases that ends in the person having AIDS. HIV is not AIDS. HIV is the virus stage of the disease during which time the virus multiplies inside the human body until the virus completely takes over. The virus is in the blood stream, and over time the immune system T-cells are destroyed. Once destruction of 90% of the T-cells has occurred, the person is said to have AIDS. (Stine, 66-70)

The Acute and first stage starts one to two weeks after the initial infection. During this time, the virus is massively multiplying. The infected person may have flu-like symptoms during this process. The early stage may last a few weeks or a few months. The person may feel as if they have mononucleosis. They may have a fever, their body aches, and they have swollen lymph nodes, headaches, constant fatigue, and some weight loss. The most important blood test finding is the appearance of HIV antibodies which show up one month after the initial infection. Antibodies are detected by the Western Blot Test. The problem is very few people realize that they have been exposed to anything other than flu and they do not have the AIDS test. The person, even while feeling only mild flu-like symptoms, may affect others. Once this early acute stage is over, the person returns to normal health and feels fine. (Stine, 75-80)

The second stage is called Asymptomatic HIV. During these months, there are few chronic signs in the body. The only way to know that the HIV virus is present is to monitor the T-cell count in the blood to check the progression of the virus. This stage can last for seven to twelve years. Most people are not even aware they have HIV. The problem is they can infect other people during this time and not even know it. There are no signs or symptoms in the second stage which indicates the person is sick so partners do not know to be cautious. In the U.S., 21% of people do not know they are HIV infected. (KFF, Feb 2009)

If they do not get a blood test done they will not know. The only recurrent symptoms that appear to warn the person that their immune system is failing is persistent swollen lymph nodes and little infections that come and go. During this time, however, every organ is being affected by the virus. If the T-cell count is being monitored by blood tests and if the count falls below 200 cells per cubic millimeter of blood; the person enters the third stage and has full blown AIDS. (800 is normal) (Stine, 80-89) These are the residents you may see in your nursing home which are admitted directly from the hospital.

The third stage or Advanced HIV is AIDS. When the T-cell count goes below 200, the person with the virus is diagnosed with AIDS. When their T-cell count goes below 50, they are at the highest risk for opportunistic infections and malignancies. With no immune system to fight invading viruses and bacteria, the person with AIDS is susceptible to catch many infections. General symptoms which occur in the end stage with AIDS are swollen lymph glands, diarrhea, night sweats, unusual tiredness, and yeast infections. The infections and cancers take over the AIDS person's body and cause death. One disease which causes individuals with HIV much discomfort is Candida. This is a white, yeast infection on the tongue, lips, and throat causing extreme pain with eating and swallowing. Although Candida can be caused by over use of antibiotics and chemotherapy, if it progresses into the throat it is usually indicative of AIDS. Individuals with AIDS also develop tuberculosis and a certain type of pneumonia called *Pneumocystis Caririi* Pneumonia. This type of pneumonia is the most prevalent infection and occurs in 80% of AIDS patients. This causes shortness of breath and a feeling of suffocating as the lungs fill up with fluid and infection. This is incredibly frightening for the individual suffering from AIDS. AIDS sufferers may have two types of skin cancer: Kaposi's Sarcoma and Hodgkin's Lymphoma. Kaposi's Sarcoma manifests itself in dark brown, purplish, cancerous skin lesions which are obvious

signs of AIDS. The face is the most obvious location for these lesions but the stomach is the most common. Kaposi's Sarcoma and Hodgkin's Lymphoma are usually the cause of the severe diarrhea from which all AIDS patients suffer. The constant diarrhea is the reason for the severe weight loss. Lesions in the eyes are common symptoms which indicate AIDS. Health care professionals describe these as a portion of the visual field being covered by "cotton wool." (KFF, 2009)

Other signs staff may observe, which are as reliable as blood tests, are signs of mental deterioration: forgetfulness, loss of concentration, slowness of thought, slurring of speech, loss of balance, and deterioration in writing. In some residents, these are some of the first signs seen. The name given to this set of symptoms is AIDS Dementia Complex. Most individuals with AIDS have other STD's. Both Genital Herpes and Herpes Simplex (cold sores), which are two forms of the same virus, can actually invade the lungs and anus causing even more discomfort. The third form of the same virus is Herpes Varicella (Shingles) which develops into painful, stinging lesions on the trunk. Other STD's prevalent in AIDS residents may be: Chlamydia, Gonorrhea, and Genital Warts. Everyone wants a cure for HIV before it becomes AIDS. Researchers, however, only have treatments which delay the body's deterioration. There is no cure.

The best treatments are drugs which bolster the diminishing immune system and this in turn helps control opportunistic infections. The side effects, which are many and severe, have to be weighed against the benefits. Some individuals with AIDS stop taking treatments because of the side effects, and this results in a relapse and a quicker death.

An effective cure would mean cleansing the body of the HIV virus. However, the HIV virus will remain in the human host's cell DNA for the individual's lifetime. The virus can at any time become activated and mass produce the HIV virus which leads to T-cell and

tissue death resulting in the individual's death. Because "cleansing the body of HIV" sounds so simple, AIDS sufferers try a variety of treatments available only in an underground network.

There is a community newsletter among gay men which advertises these treatments. One such mixture is made from a Chinese cucumber, apricot pits and Chinese herbs. It has all the side effects of chemotherapy, but individuals with AIDS continue to try as many treatments as they can tolerate. Many individuals with AIDS travel to Japan to purchase Dextran Sulfate. This drug is also smuggled in from Mexico. Its claim to fame is that it is absorbed through the intestine and works against viral agents.

AIDS drugs are sold underground through buyers' clubs – small storefronts in New York, Philadelphia, Washington, Miami, Houston, Los Angeles, and San Francisco. The clubs sell supplemental or alternative products to individuals with AIDS. The buyers' clubs sell drugs made in underground labs but most are smuggled into the United States from other countries. These treatments fall into three categories. First are those which target the immune system. Second, some products focus on nutrition and IV mega doses of vitamins. Third, chemical concoctions which are questionable and sometimes dangerous to the individual with AIDS who, in search of any solace or hope, are willing to try anything. These homemade fluids are injected into the blood stream sometimes through a Hickman catheter and are touted to arrest the HIV virus. Some contain lecithin, glycerides, a chemical PC-55 and herbs. Since none of these underground drugs are approved by the FDA and do not successfully interrupt the viral replication cycle, there is no known-cure for AIDS. Research continues to be in progress.

In The Best of New York magazine June 2008, the article *Who Still Dies of AIDS and Why?* Gary Taub had this to say about AIDS. The two drugs which have "bought time"

for AIDS sufferers have been in existence since 1995. The antiviral drug known as a Protease inhibitor was introduced first and then a year later the multi-drug cocktail, HAART (Highly Active Anti-Retroviral Therapy) was welcomed by AIDS sufferers. One of the ironies of the success of HAART is that it has perpetuated the myth that AIDS is now under control, that living with AIDS is a minor inconvenience, and that AIDS, as a plague, has ended. It is correct to say that among men under 30, the AIDS rate has dropped, but for women, the AIDS rate has increased. The CDC believes this is directly related to lack of education and awareness of the disease. Among women, it is also correct that those diagnosed with AIDS are living longer, but AIDS still wins in the end and takes the life of its victims. It is true that treatment for HIV is effective, and it is possible to live a productive life for an additional 20 years with the virus, but HIV remains an incurable infection. Magic Johnson can climb mountains, but the treatments with HAART in between the mountain climbing is miserable and sometimes unsuccessful and disabling for many.

Michael Mullen, clinical director of infectious diseases at Mt Sinai School of Medicine in Baltimore, Maryland, says that the best way to think about AIDS deaths is to divide HIV infected individuals into three groups. The majority of deaths (approximately 40%) occur within the first group who either never started HAART to begin with or don't stay on the treatment once they begin it. They die from the same AIDS related illnesses that most individuals suffering from AIDS die from, but more quickly. These include: *Pneumocystic* pneumonia, viral or bacterial infections which spread through the central nervous system, Hepatitis, Kaposi's sarcoma, and Lymphoma. A large number of these AIDS sufferers are very poor, homeless, drug users, and they simply cannot or decide not to do what it takes to fight the disease. Nine times out of ten they will not take the medicine because of drug use. Many have full blown AIDS before they are even diagnosed with HIV virus. The second group (35%) is

made up of those at the other end of the spectrum who take extremely good care of themselves. These are people with AIDS who have taken HAART every day and have taken the treatments and have been able to suppress their HIV virus for 20 years or more. They have very little chance of dying of the usual AIDS illnesses as the first group and will die of heart disease or cancer just like the rest of the population. They are the lucky ones who will die of old age. Cancer does appear to be more of a problem in individuals with HIV. Cancer seems to strike and kill the person with HIV more quickly. This makes sense since their immune system is still weaker, and the HAART therapy may weaken the immune system even more. Individuals with HIV, as a whole, are smokers, have Hepatitis B or C and develop liver and kidney disease. The third group of HIV infected individuals is in the middle of the two extremes. HAART has been a lifesaver for them but has not given them a normal life expectancy or a high quality of life. These individuals, who are still alive, were diagnosed with AIDS before HAART was invented (25%). HAART helped them survive, but they do not derive all the benefits of HAART. Their virus had the opportunity to mutate because it got a foothold in their systems before they began HAART. They get sick very frequently from damage done during those early years, and some lose the battle with AIDS or commit suicide from too long a life of misery.

The Center for Disease Control publishes surveillance reports every month about HIV/AIDS.

- During the mid-to-late 1990's, advanced HIV treatments slowed the progression of HIV infection to AIDS and led to dramatic decreases among individuals with AIDS living in the 50 states and the District of Columbia.
- Estimates for 2006 and 2009 suggest that the number of AIDS cases

remained stable and that the number of deaths decreased; however, it is too early to determine whether this trend will hold. Better treatments have also led to an increase in the number of individuals who are living with AIDS.

- In 2006, the most recent statistics show that 1,500,000 individuals are living with HIV/AIDS in the U.S. (KFF, Feb 2009)
- As of 2006 45,000 - 57,000 individuals per year are diagnosed with HIV/AIDS. 60 – 70% of these are homosexual men. 25% are heterosexual women. (The discrepancy comes from the fact that the CDC suspects there may be individuals not reporting their illnesses.) (KFF, Feb 2009, CDC, Mar 2009)

*(CDC Surveillance Report, May 2005, June 2007) (The most recent statistics available are from 2007.)

The National Institutes of Health publishes fact sheets every month about HIV/AIDS.

- Blacks, or African Americans in the U.S. account for almost half of the estimated number of HIV/AIDS.
- The AIDS rate per 100,000 among black adults/adolescents is more than nine times of whites in 2006. HIV is the 4TH leading cause of death for black men and the 3RD cause of death for black women.
- Young adults aged 13-29 of all races combined, account for the largest proportions of newly diagnosed HIV/AIDS cases. This group accounts for 34% of new cases.
- Approx. 60 – 70% of newly diagnosed HIV/AIDS cases among adolescents and adults were for gay or bisexual males.

- Today, 26% of newly diagnosed HIV/AIDS cases are contracted by women from having heterosexual sex. Many are young. The percent of young girls age 13 – 19, varies by race. Black teens represent 69% of new cases. Latino girls, 19%. White girls, 12%. Young children and infants account for 1% of new HIV/AIDS cases. This number is mainly representative of infants who contract HIV through their mothers at birth. Older women are also at risk. Women over 55 and young girls age 13 – 19 seem to be the most uneducated about AIDS & heterosexual sex.

As part of the course, study The National Institutes of Health (NIH) website, the Center for Disease Control (CDC) website and the Kaiser Family Foundation (kff.org) website (The Kaiser site is the most user friendly of the three) for:

- Statistics pertaining to your state. Study the numbers of newly diagnosed HIV/AIDS cases for this year.
- Statistics for which age group are the most affected in your state?
- For statistics pertaining to the races most affected in your state.

Transmission of HIV/AIDS occurs in five ways: homosexual sex between two men, heterosexual sex between a man and a woman, drug use which involves sharing needles, pregnancy in which the mother gives the virus to her children during childbirth, and blood transfusions during the 80's which had the HIV virus in the blood. The transmission of HIV can be prevented; it is relatively hard to contract and can be avoided. People do not “catch” HIV the same way they catch a cold or flu. HIV is not spread by coughing, sneezing, tears, or sweat. The virus cannot be transmitted by an infected person's clothes, phone, or toilet seat. It is not passed on by eating utensils, drinking glasses, or other objects the HIV infected person has used. HIV is not transmitted through daily contact with

infected people either at work, home or school; even kissing is considered very low risk. There has never been a documented case to prove HIV is transmitted by kissing. It is not transmitted through bites from a biting insect such as a mosquito, flea, flies, or lice. (Ward 226-259)

A dentist, Dr. James Cottone, came up with what is referred to as *The Swimming Pool Analogy* as a way to understand the meaning of “virus load” and how easy or how hard it is to contract HIV. (Cottone, 1999) Basically, the analogy goes like this: If one ml blood (1/4 teaspoon) carrying the Hepatitis B virus were dripped into a swimming pool with 24, 000 gallons of water and mixed well; and if one ml of that solution were injected into a susceptible individual, that individual would develop Hepatitis B. In contrast, if one ml of blood from an AIDS patient were dropped into a *quart* of water and one ml of that solution were injected into a susceptible individual, there is only one in ten chances that the individual would develop HIV antibody indicating HIV infection. The implication is that HIV is not easy to acquire.

Even though HIV has been isolated from blood, semen, saliva, serum, urine, tears, breast milk, vaginal secretion, lung fluid, and cerebrospinal fluid, this does not mean it can be transmitted through all these fluids. The swimming pool analogy explains why. Test results indicate that even though HIV cells are found in all these fluids, there are not large enough quantities in urine, cerebrospinal fluid, lung fluid, saliva or tears at any time for transmission to take place. The number of viruses is so small that the risk is nonexistent. (Taub, Gary, 56-58)

Semen carries significantly larger numbers of HIV cells than vaginal fluid. This accounts for why homosexual men are a much harder hit group. (Ward, 98) Blood carries the largest number of infected lymphocytes. When a group of drug users prepares to inject a

drug into their veins, one person is chosen to first draw their own blood into the syringe and then mix it with the drug. This syringe, filled with one user's blood and the drug, is then passed around the circle of other drug users and each person injects a small amount of the blood/drug into their own vein. This is why "sharing of needles" literally means sharing of drugs and blood when it is injected in this way. If any one of the friends in the circle of users has HIV, the others are at a high risk to acquire it if they are in the circle after the HIV sufferer uses the syringe. There is an unusual "inner circle of trust" that exists in these drug circles of friends and it is considered a breach of friendship to decline to "shoot up" with the circle. (Stine, 268-270)

Giving birth is high risk for an infant if the mother has HIV because of the contact with the mother's blood and with her vaginal secretions. This double exposure is what puts infants at risk. Vaginal secretions can transmit HIV but not as readily as semen. Semen deposited into an unsuspecting female is what is spreading HIV among the heterosexual group. (Ward, 102-104)

It is believed that certain aspects of a person's lifestyle and medical status predetermine the risk of HIV infection upon HIV exposure. For example, if a man or woman already has some other infection, an open sore, has used drugs or already has a weakened immune system, he or she would be more susceptible to HIV infection. Such conditions are called cofactors. People with a suppressed immune system are especially in danger for contracting other STD's as well as other illnesses. One or more STD's are present ninety percent of the time in individuals with HIV. (KFF, May 2009)

The STD's most prevalent are Genital Warts, Genital Herpes, Chlamydia, Gonorrhea, Hepatitis B and Syphilis. Nursing home staff members need to be aware of and able to recognize all STD's. They are contagious and may serve as warning signs that a

resident is HIV/AIDS positive. Genital warts are painless growths found on or around the genital and anal areas. They are caused by the human papilloma virus. Despite treatment, genital warts cannot be cured and often recur. In women, infection with certain strains of human papilloma virus can increase the risk of developing cervical cancer. Genital herpes is a viral infection that causes painful sores on and around the genitals or anal area. It is easily spread, and the disease tends to occur in the first few years after initial infection.

There is no cure, but there are medications that can help relieve symptoms. Syphilis is a bacterial infection that can damage organs over time if untreated. The first symptoms of syphilis are ulcers called chancres. Left untreated, about one third of cases will go into the later more damaging stage which causes blindness, arthritis, kidney failure and extreme pain. Hepatitis B is a virus in the blood, saliva and semen of an infected person. If the person is aware of it, it can usually be treated; however, if not treated or left too long in the blood without treatment, Hepatitis B causes liver disease, liver damage and sometime liver cancer. Gonorrhea is a curable STD which can infect the genital tract, the mouth and the rectum. It is usually spread through sexual contact and causes pain, blisters, discharge, and sterility. An infected woman can pass the bacteria to her baby during delivery. Chlamydia is a bacterial disease that produces an infection very similar to gonorrhea. Up to 50% of men and 75% of women do not experience any symptoms so it is more serious and causes damage before it is detected. It can cause pelvic inflammatory disease with pain, permanent damage in women and infertility in both sexes.

The Wise HIV Virus

The HIV virus, in its infinite destructive wisdom, knew which cells to attack first. The dendrite cells, a class of white blood cells, are the cells the HIV virus attaches to first. Dendrite cells are fascinating parts of the immune system. It is their job to attack new pathogens and to establish

“memory” so our body recognizes familiar invaders and responds lightening fast. They live in all the tissues of our body and fight to keep bacteria and viruses out. Under the microscope, millions can be found in our noses, lungs, and intestines waging war against unwanted organisms. If not for our loyal defenders, our body would succumb quickly to pneumonia, urinary tract infections, gastroenteritis, pink eye and skin ulcers, to name a few. You name it - - we would have it. Although dendrite cells are relatively scarce and small, their memory is extraordinary. If they recognize a foreign organism, they readily recognize it as the enemy and will launch a rapid attack.

Just imagine, it’s Pearl Harbor in the beginning of WWII. A giant squid (the dendrite), as seen in “20,000 Leagues Under the Sea,” has gobbled up twenty attacking Japanese airplanes (bacteria and viruses). The squid spits one Japanese flag back out of its mouth and flies it for all other Navy, Army, Air Force and Marines to see. The armed forces represent the T-cells. They (T-cells) would from that day forward recognize the “Red Sun” as danger and attack. They are taught by the dendrite cells what to fear and destroy by the kind of “flag” the squid flies. The dendrites educate the “T” cells in this way. You can see why it is such a loss for the body’s immune system to lose “T” cells to the enemy. In the case of the ingenious HIV virus, the “T” cells are the very cells it chooses as its site for multiplication.

Let’s look at the stages this incredibly intelligent virus takes and how each works. Though small in size and number (only .2% of white blood cells in the blood), they operate like an octopus by attaching their suction cup arms to the invading bacteria or virus the same way an octopus or squid eats its prey. (Interesting how nature repeats itself.) If the virus tries to swim away, they even have the ability to zap it with a paralyzing toxin. Once the virus or bacteria is taken into the dendrites body and dissolved, one small remnant is presented to the outside world (outside of the dendrite, that is). This presentation is called an antigen and is used to show T-

cells what bacteria or virus to attack. The T cells memory becomes imprinted with an “image” of an invader. Once educated, the T cells can go on to prompt what is called B cells to produce antibodies that bind to and inactivate foreign invaders (the antigens). These “memories” can remain in the body for years in case the invader ever returns. The tragedy of the HIV virus is that the virus itself invades the T cells and uses them as a virus factory for itself. The T cells make the HIV virus against their will. In the process of churning out millions of HIV viruses, the T cells are depleted and die. Once the host, the HIV patient, is depleted of T cells, he/she has no defense system left.

Activating naïve, “virgin” T cells is the basis of vaccines for HIV. Scientists are now turning to the new knowledge of the role that dendritic cells play in immunity against microbes and their toxins. Several vaccines are being investigated for preventing or treating HIV. HIV’s genes mutate rapidly, giving rise to many viral strains; hence, a vaccine that induces a reaction against certain strains might have no effect against others. By comparing the genomes of the various HIV strains, researchers can find sequences that are present in most of them and then use those sequences to produce purified viral protein fragments. These can be tested for their ability to induce immune protection against strains found worldwide. These vaccines might also be tailored to the HIV variants prominent in particular regions. Whether the vaccine approach uses dendritic cells to fight a particular virus, as in the HIV, or to turn off the activity of T cells and dendritic cells in instances where they exacerbate disease instead of fight it, is to be decided. Two doctors in the Netherlands, Dr. Carl Figdor and Dr. Yvette Kooyk, are working on a new treatment based on a better understanding of the best approach using dendritic cells. Their work is being watched closely with great hope by millions of HIV sufferers. You can read more about their work in *Cell* magazine, Vol. 106, No. 3, pg.271-274, August 2001 and *Antimicrobial Agents*, Vol. 50, No. 1, pg. 220-225, January 2006.

AIDS in the United States Compared to the World

AIDS in the world today is far different than the picture of AIDS in the United States. In America, 16,700 people die of HIV/AIDS each year. The poorer countries, notably sub Saharan Africa and part of Asia, lose three *million* lives each year to the disease. (CDC, United States Population Division, May 2009)

In addition to the enormous human tragedy associated with HIV/AIDS, the economic costs are staggering, posing serious impairments to the growth and stability of many developing countries. HIV/AIDS has disproportionately affected young and middle aged adults who are the mainstays and breadwinners for their families. No wonder the very countries which are hardest hit with HIV are also the ones with the most starvation. In many developing and very poor countries, HIV has reduced the labor supply and productivity so that skilled workers, teachers, managers and health care workers are in short supply. In the poor countries, three million people die of AIDS each year, but another 33 million - 40 million are living with HIV. (CDC, UNAIDS report, July 2007) (KFF Feb 2009)

In order to put AIDS in perspective, consider that starvation is the leading cause of death *in the world*.

- 14,600,000 children die of starvation in the world each year. (40,000 children die each day).
- HIV is the next largest cause of death in the world at 3,512,000 per year.
- 3,346,000 individuals die of respiratory infections in the world per year. Compare these numbers to the causes of death in the United States.

(*CDC Disaster Center, July 2008)

A study by the Carter Center in 2005 (KFF, May 2008) estimated that two thirds of deaths in the United States are due to six risk factors, all of which are choices. In other

words, 66 2/3 % of the deaths in the United States are preventable! What the millions worldwide who are dying would give to be able to have an option to death! The six factors causing death in the U.S. in order of death rate are as follows: tobacco use, alcohol use, automobile accidents, high blood pressure, obesity and sexual behavior.

- Out of every 100,000 individuals in the U.S., 4.9% die from HIV/AIDS.
- 4.4% die from traffic accidents.
- 28% die from heart disease which includes high blood pressure and heart attacks from cholesterol.
- 2.1% die from alcoholism.
- 24% die from smoking related problems which include lung cancer, pneumonia, and emphysema.
- 2.4% from obesity related illnesses.
- 35% are from a variety of other illness and accidents.

*(CDC Disaster Center, July 2008; KFF, Feb 2009)

The United States, no doubt, has a problem with HIV/AIDS and STD's. The world has an even bigger problem with HIV/AIDS. As big a problem as HIV/AIDS is, the United States and the world have bigger issues to deal with. Other problems of society and other illnesses are claiming lives in greater numbers than AIDS. In 25 years, AIDS has killed 25 million people in the world. This disease is a destructive one. It has also made poverty and living conditions much worse because of the effects in underdeveloped countries. Much remains to be done in regards to making sure all countries have the medicines to work with and the care and prevention that the United States has for its citizens. Only then will HIV/AIDS be under control for all countries and a cure more than a dream.

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