LECTURE 1

INTRODUCTION TO THE COURSE
TERMS AND LANGUAGE IN PATHOLOGY AND MEDICINE

MAMMALIAN PATHOBIOLOGY
PATB 4130 / 5130

Introduction

For some or even most of you, this course will be your first introduction to the fundamental concepts that form the basis for our understanding of disease. According to Dorland’s MEDICAL DICTIONARY, “disease” is defined as “A definite morbid (pertaining to disease) process having a characteristic train of symptoms; it may affect the body as a whole or any of its parts, and its etiology (cause), lesions (any deviation from the generally accepted norm in a cell, tissue, or organ including its structure and/or function), and prognosis (a prediction of the outcome of disease) may be known or unknown.

Why is this course important? Some of you may already have had a course in disease such as Diseases of Wildlife or Diseases of Food Animals and Horses taught by this Department. If so, you were likely confronted by a massive amount of new information which you were poorly equipped to comprehend. This course will provide you with the basic principles that will guide your further understanding of disease and how disease is studied. This is NOT a disease course, per se; certain diseases will, however, be covered to illustrate some of the basic principles you will need to learn.

The three primary instructors are not in total agreement regarding the philosophy underlying this course. Course content could range between the extremes of traditional morphological pathology to more modern breakthroughs in the understanding of disease at the molecular level. This is good; you should have an appreciation for the value of traditional versus molecular concepts of disease. You will be exposed to morphological aspects of disease through photos illustrating gross, light microscopic and even ultrastructural changes/lesions. We realize that even though you likely have a good appreciation for normal anatomy, few of you would have any formal training at the microscopic level examining cells and tissues. These photos are presented to illustrate specific points and we will walk you through these photos to point out the normal as well as the abnormal. You will not be expected to be proficient at visually recognizing lesions nor will you be tested using photographic material.

Information concerning this course including goals, reference texts, class attendance/participation, etc, can be found on the Veterinary Sciences departmental website

It is not necessary to cover these. I do want to say a word about class attendance and class participation. We expect you to participate in class and to answer as well as ask questions. To do this you must be here. To do this effectively you must be prepared; read and study your class notes or PowerPoint presentations prior to class. Don’t be afraid to volunteer answers to questions we might pose in class. Likewise, don’t be reluctant to ask questions. If you are confused or need clarification, it is more than likely that some of your classmates are in the same boat. Your answers to our questions and your questions themselves are also important for us, your instructors, to assess on a class-by-class basis how you are doing. We don’t want to wait until test time to figure out there are problems and neither should you.

**Terms and Language in Medicine & Pathology**

The language of medicine has evolved over centuries. Unless you are an accomplished student of Greek or Latin, the roots or derivations of many medical terms and the medical terms themselves will present challenges and even obstacles to your fundamental understanding of disease. Your knowledge of medical terminology will increase with time if you remain in a field of medicine or related career. A textbook is not required for this course. If I could recommend that you purchase one book, however, it would be a medical dictionary. There are several available, Stedman’s and Dorland’s are two tried and true dictionaries but there are others equally as good; importantly, these can be purchased for a fair price. In lieu of purchasing a medical dictionary, several are available on-line. A daunting task for sure but once you become familiar with many of the derivations, you can figure out the complex meanings on your own and the language of medicine will become second nature. As an example, the medical term for softening of the white matter of the brain is **leukoencephalomalacia**:

- **leuko** = white
- **encephalo** = pertaining to the brain
- **malacia** = morbid softening

From here, you can take these roots and combine them with others to form equally specific medical terms.

- **Leukocyte** = white cell = white blood cell
- **Leukoderma** = white skin = loss of melanin pigmentation in skin. Leukoderma can be associated with certain **autoimmune** skin disorders such as Vogt-Koyanagi-Harada and lupus erythematosus.
- **Polioencephalitis** = inflammation (itis), gray matter (polio), brain = inflammation of the gray matter of the brain. This pattern of inflammation is typical of some **neurotropic** viral infections of the central nervous system.
- **Kerato-** and **osteomalacia** = softening (malacia) of the cornea (kerato) or bone (osteo).

To make matters more complicated, many diseases and syndromes are named after the individuals who are credited with their initial discovery or associated early on with the disease. Do the terms Hallervorden-Spatz, Charcot-Marie-Tooth, or Aujesky’s disease mean anything to you? Fortunately, use of eponyms is less common and some of these are being replaced by more common-sense medical terms. Other diseases such as **Huntington’s**, **Parkinson’s**, and
Alzheimer’s are well known and so entrenched in the medical literature that they are likely there to stay.

Unfortunately, the use of acronyms is also common. MRSA is a commonly used term for methacillin-resistant *Staphylococcus aureus* infections that many of you are probably familiar with because of common usage in the lay press. Another you are probably unfamiliar with is MELAS (mitochondrial encephalopathy with lactic acidosis and stroke). The explosion of acronyms in molecular biology is especially worrisome and challenging and in many scientific articles, these acronyms are not defined:

- NFκB = nuclear factor kappaB
- MAPK = macrophage associated protein kinase
- MARCO = macrophage class A receptor with collagenous structure
- NOD = nucleotide-binding oligomerization domain

**TYPES OF ‘DIAGNOSES’ IN PATHOLOGY AND MEDICINE**

**MORPHOLOGICAL DIAGNOSIS** – Pathologists use morphological diagnoses every day. Morphological diagnoses are a brief summation of the changes in the body (lesions) associated with disease. The basic morphological diagnosis usually gives some appreciation for duration (acute, subacute, or chronic), distribution (focal, multifocal, diffuse), the lesion itself, and the area of the body affected. Provided these basics are covered you can make a morphological diagnosis as complex or as simple as you want.

- **Acute, diffuse, purulent, bronchopneumonia** = Pus-forming inflammation of short duration affecting the entire lung or one of its lobes. Additionally, using the term ‘broncho’ implies that the cause of the pneumonia entered the lung via the airways.

- **Chronic, multifocal, ulcerative gastritis** = Multiple focal ulcerated areas of long duration involving the lining of the stomach accompanied by inflammation.

**ETIOLOGICAL DIAGNOSIS** – This diagnosis is the presumptive or confirmed cause of the lesion or disease. Etiological diagnoses can encompass basically all the various causes of disease ranging from genetic mutations, faulty nutrition, microorganisms, and so on. For instance, MRSA cultured from an abscess would represent an etiological diagnosis.

**DISEASE DIAGNOSIS** – If all parts of the puzzle fall into place (clinical symptoms, lesions, and the etiology is identified), a diagnosis of the disease can be given. For instance, an adult sheep with wool loss, clinical signs of intense pruritis, and various neurological manifestations dies and spongiform lesions and accumulation of abnormal prion protein are found in the brain; the disease can be reliably diagnosed as scrapie.

**LEARNING THE TERMINOLOGY AND LANGUAGE OF MEDICINE AND PATHOLOGY WILL BE YOUR CONSTANT ASSIGNMENT FOR THIS CLASS**

I could provide you with a list of terms and acronyms that you should know but this would be superficial at best. What we will do in the class notes is to highlight in **bold print** terms that you
will be held accountable for. It will be up to you to look up and be able to derive the meaning or definition. You should do the same for any terms you do not fully understand. Under the simple definition of “disease” provided above are three terms in bold print that you might not understand and that I have provided meaning for. This will be your perpetual assignment for this class. Learn, understand, and be able to use this terminology correctly. This is a daunting challenge but if you approach this assignment seriously, you will be amazed at how far you will progress this semester. In this day and age, how might computers and the ability to store and retrieve complex medical data impact medical terminology?

ONE TERM YOU MUST KNOW BEFORE YOU FINISH THIS CLASS IS:

PATHOGENESIS

CLASS ASSIGNMENT:

The following is the name of a disorder in humans; the diagnosis being made in the father of a friend here in Wyoming:

“agnogenic myeloid metaplasia with myelofibrosis”

Please come to class prepared to discuss each term and what would be your perception of this disease.