An Introduction to Clinical and Physical Examination of Dogs and Cats

***Rodney S. Bagley DVM**, DACVIM (Neurology and Internal Medicine)*
Professor, Neurology and Neurosurgery
College of Veterinary Medicine, Washington State University
Pullman, Washington

Insufficient examination and inaccurate observations are more common causes of incorrect diagnoses than false conclusions from correct and sufficient facts.
Paraphrased from R. N. DeJong 1967

Clinical examination is the foundation of good medical practice. A thorough physical evaluation is most likely to yield accurate and appropriate clinical information. Clinical "clues" afforded by looking, touching, listening, and even smelling are the foundation of clinical intuition and diagnostic acumen. Adopting a stereotypic approach to basic physical clinical assessment ensures that critical observations are not missed during the evaluation process.

The process of physical examination involves collection of data regarding the abnormality of function. In general, the steps followed during clinical evaluation of animals include:

- Determination and clarification of the presenting problem (the *chief complaint*). Why is the animal here?
- Determination of the temporal course of the problem (*historical perspective*). When did the problem start? Is the problem getting better, worse, or staying the same?
- Performance of a physical examination and assessment of physical clues
- Determination of which regions or areas of the body are abnormal or (potentially) involved with the disease.
- Establishment of a list of diseases that can affect or cause disease in the particular area of body in question. This is often referred to as the *differential diagnosis.*
- Determination of which diagnostic test will establish if the disease is present and its extent. This is the *diagnostic testing* portion of clinical evaluation.
- Establishment of a *treatment* plan for this disease
- Providing the owner a realistic idea as to what to expect in the future (the *prognosis*)

In the beginning of your training as doctors, this process makes take much conscious thought and practice. With practice, this process will become more "intuitive" and "natural". Until that time, however, this practice will take substantial and consistent practice. As physical examination is the cornerstone of clinical practice, there are not short cuts in acquiring these skills! Practice, practice, practice!

Goals of the Physical Examination

Information collected during the physical examination is used in two main ways:

1. To determine if abnormalities exist in the body
2. To determine the location of the these abnormalities within body

Through examination and assessment of appearance, shape, size, consistency, and function, clues to the presence and location of disease within the body are identified. While an examination is often described as "complete", physical assessment is rarely so due to limitations of access and time, and even other factors such as patient cooperation. An "overview" assessment is followed by more thorough and critical assessments of regions or locations that warrant such scrutiny based on physical or historical clues.

Signalment, History, and Chief Complaint

Basic patient characteristics (age, breed, gender) are usually gathered prior to physical assessments, except in some emergency situations. As many diseases are breed associated, the signalment may provide a fundamental clue to the etiology of the disease. The age of the animal at the onset of clinical signs is helpful, as some diseases, such as inherited or congenital defects, affect younger animals whereas others, such as brain neoplasm, generally affect older animals. A few diseases occur specifically in one gender of animal.

Chief Complaint and History

It is always important to determine why the owner has presented the animal for evaluation (the chief complaint). Initially, the owners are asked to describe what abnormality they are concerned about. Unfortunately, owners' descriptions of clinical problems can be misleading. The accuracy of an owner's observation is dependent upon how knowledgeable the owner is regarding medical abnormalities, how familiar they the owner is with normal animal appearance, behavior and movement, and how astute they are in previous observation of the animal. In some instances, the clinical abnormalities found by the clinician may be different from those that the owner has concerns about. Addressing the reason that caused the owners to present the animal for evaluation is important for client relations and overall client satisfaction.

Historical information is obtained through communication with the owner and review of historical records of the patient. An appropriate historical review is adapted to the particular clinical situation. Commonly, historical information includes a general history of systemic health and prophylactic care (vaccination). With regard to the any specific potential problem, questions should be asked to assess the *owner's concern* or *chief complaint,* the *duration,* and the clinical *course* (progressive, unchanged, improving) of the problem.

Commonly asked historical questions include:

- Coughing? Sneezing? Vomiting? Diarrhea?
- PU/PD/PP? Water consumption? Food Consumption?
- Vaccinations? When and What?
- Deworming previously?
- Heartworm tested (Dog)? FeLV/FIV tested (Cat)?
- Travel history?
- Current medications? History of drug reaction?
- Disease in parents, siblings, offspring, others in the environment?
- Toxin exposure?

Clarification of the *temporal course* of the presenting complaint is invaluable, but is also sometimes difficult due to inaccuracies of owner interpretation of signs. It is a common trait of human beings, once a clinical problem is identified, to go back and mentally search the past for causes, factors, or events that may have contributed to the abnormality. For example, many animals are presented for evaluation of abnormalities in walking. In some cases, the animal may have historically fallen, which focused the owner's attention toward the walking problem. However, it is also plausible that the animal had dysfunctional limbs prior to falling, but that this dysfunction was unrecognized and was exacerbated by the falling episode. It is important for the clinician to keep an open mind and guard against being too trusting of historical accounts. Some of the best clinicians are *always skeptical* of apparently obvious facts.

When verbally communicating with owners, it is important to ask questions that are not inherently biased, leading, ambiguous, or intimidating. Open-ended questions such as "what did you see" or "what did your animal do" are helpful, as they allow the owner the ability to describe abnormalities and events in their own words.

Historical questions will need to be adapted for each individual animal's situation to clarify the presenting problem. Specific questions (i.e., was the animal exposed to toxic substances or has similar disease been observed in genetically associated animals, siblings, offspring, or housemates) may need to be asked depending upon the presenting complaint.

The Clinical examination process

An initial assessment is used to determine if the body is normal. In veterinary medicine, this is challenging due to the diversity of species, breeds, and individuals within a breed. Additionally, certain breed "characteristics" are often inbred abnormalities of structure or function, such as the chrondrodystrophoid nature of the Dachshund. The experienced clinician understands and recognizes these diverse physical differences. The inexperienced clinician must gain such knowledge through repeated examination of a diverse population of individual animals.

Observing, touching, and manipulating the animal are paramount in determining the presence, location, and extent of any disease process. Patient examination identifies functional and anatomical abnormalities associated with disease. The significance of abnormalities identified by subsequent diagnostic testing can be determined only by an understanding of the associated clinical features and signs found in the animal. Many clinically detectable abnormalities are indicative of dysfunction of specific functional components within the body. Clinical signs resulting from dysfunction of the body may be pathognomonic for a specific disease process such as differential cyanosis. Other clinical abnormalities, however, merely reflect the location of involvement of disease within the body.

The physical examination process should be used to assess important functional components or subdivisions of the body. The various components of the examination are used to determine the functional capabilities of specific components of the body. What follows is an overview of physical assessment of dogs and cats that the student can begin building on with clinical experiences. There are a number of potentially successful strategies for physical assessment. Some use principles of anatomical location ("head to toe" in direction) while other assessments may be centered on functionally related body organ systems. Initial assessments may be expanded with more specific body system assessments, such as ophthalmological, neurological, or musculoskeletal assessments.

Using a combination of approaches, the following are many of the important body systems that are assessed during the physical examination process:

- Eyes, ears, nose, and throat (EENT). This includes a retinal observation assessment.
- Skin (integumentary system)
- Peripheral lymph nodes
- Thoracic cavity (primarily through auscultation, percussion, and palpation)
- Abdominal cavity (primarily through palpation)
- Limbs (including neurologic musculoskeletal function)
- Rectal examination
- Vaginal examination (female)
- Penile examination (male)
- Pain and sensation

The clues to some physical assessments are determined through initial owner questioning, some are observational assessments, and still others require a "hands-on" approach, wherein the animal is palpated and manipulated.

Surprisingly, a significant amount of information can be collected relatively quickly by simply observing the animal's appearance, how the animal is postured, reacts in the environment, moves, and walks. In some instances, specific movements or postures are extremely helpful in determining where abnormalities exist within the body.

Astute clinicians will mentally prepare for clinical evaluation by anticipating abnormalities that may be found during the examination process. If, for example, an animal is presented with a specific abnormality, a mental review prior to the physical examination of pathophysiologic processes that can result in the particular presenting abnormality may help in focusing the clinician's attention on necessary physical assessments to determine the degree and extent of the abnormality. As an example, an animal is being presented for inability to stand in the pelvic limbs. A mental review of general body systems that, when affected with disease, could result in pelvic limb movement abnormalities might include the musculoskeletal, neurologic, cardiovascular, and metabolic systems of the body. This pre-evaluation mental assessment might help to focus physical evaluations on critical assessment of these body systems. Obvious clinical findings, such the lack of a pulse in a limb, are less likely, therefore, to be overlooked.

Each individual clinician will hopefully follow a physical examination process that works for them and at the same time is as complete as possible. Within the mind of each clinician there is often an "internal dialogue" regarding what the clinician is observing or evaluating. Often, this internal dialogue follows a question/answer pattern. One of the important questions that a clinician asks is "Is this normal or not". If not normal, what characteristics make this particular finding abnormal? The following lists some possible internally asked questions that might occur during your physical assessments.

Questions that might be asked (internally) by the examiner during the physical examination by the clinician

Body Condition?
Body Weight? (Obese? thin?, muscle atrophy?)
Pregnant?
Lactating?
Mucous membrane color?
CRT?

Hydration status?

Any abnormalities of appearance?
Any abnormalities of the hair coat or skin?
Hair loss patterns?
Discoloration?

Redness?
Papules?
Pustules?
Raised lesions?
Focal enlargements?
Crusting?

Any regions of skin more or less affected?

Head?
Size?
Shape?
Muscle size, tone, and function?

Eyes?
Position?
Cornea?
Sclera?
Iris?
Pupil size, responsiveness?
Lens?
Vitreous?
Retinal? (requires fundic examination)

Vision?

Ears?
External appearance?
Smell?
Discharge?
Otoscopic examination?

Nose?
Appearance?
Position of the philtrum?
Discharge?
Mucosal color?
Airflow?
Ability to smell?

Throat and mouth?
Mucous membrane color?
Moistness?
Teeth?
Smell of the breath?

Enlargements?
Salvia?
Tongue? (appearance and movement)
Tonsilar region
Palate?
Ability to swallow, gag?

Lymph nodes (peripheral)?

Palpable or not?
Enlarged?
Painful?
Discharge?

Chest cavity?
Palpation?
Percussion?
Auscultation?
Heart sounds?
Heart rhythm?
Heart rate?
Peripheral pulse quality?
Jugular pulses?
Carotid?
Auscult over any swelling or enlargement in the limbs?
Brahman's sign?
Character of respiration?
Rate?
Rhythm?
Abdominal breathing?

Abdominal cavity?
Enlargement?
Distension?
Fluid wave?
Size, consistency of organs?
Abnormal masses?
Tone in muscles of the body wall?
Mammary glands?

Limbs?
Function?
Proprioception?
Enlargements?

Pain?
Joints?
Range of motion?
Effusion?
Pain?

Feet?
Appearance of toes and toenails?
Abnormal perfusion?
Toenail wear?
Pain?
Foot pads?

Rectal palpation?
Tone of sphincter?
Feces? Amount, appearance, consistency?
Masses?
Pelvic canal dimensions?

Vaginal?
Vulva?
Mucous membrane color?
Size?
Discharge?

Penis?
Mucous membrane color?
Size?
Discharge?
Vessels?

The four senses of physical examination

A. Information Gathered through Observation (looking) of the Animal

What does the examiner observe about the animal when viewing the animal from a distance? Astute and accurate observation is one of the most important of all clinical skills during physical assessments. The way an animal moves, acts, or looks often provides important clues to the location and type of clinical dysfunction.

Movement
External appearance
Body discharges (urine, feces, salvia, tears)

B. Information Gathered through listening

- External listening

- Auscultation

C. Information Gathered through Smelling
- Breath
- Ears
- Wounds and discharges
- Urine
- Feces

D. Information gathered through touching
- Consistency
- Size
- Pain

About the only thing that is not performed in the modern era of medicine and understanding of infectious diseases is tasting!

After the Clinical Examination is completed

Following the clinical examination process, abnormalities are identified and often listed in order of most-life threatening to least life-threatening. This is commonly referred to as establishing ***a problem list***.

Ultimately, this information is processed, associated, correlated to formulate a diagnosis. The diagnosis is the truth about what is happening that is abnormal in the patient. The diagnosis at this point falls into 1 of 3 general categories.

- A ***definitive diagnosis*** – the clinical features are so characteristic that there is only 1 specific etiology that could result in these findings. This is also referred to a pathognomonic.
- A ***presumptive diagnosis*** – the clinical features are so characteristic for a single disease that this disease etiology is the most likely
- A ***differential diagnosis*** – the clinical features are characteristic of more than one disease etiologies

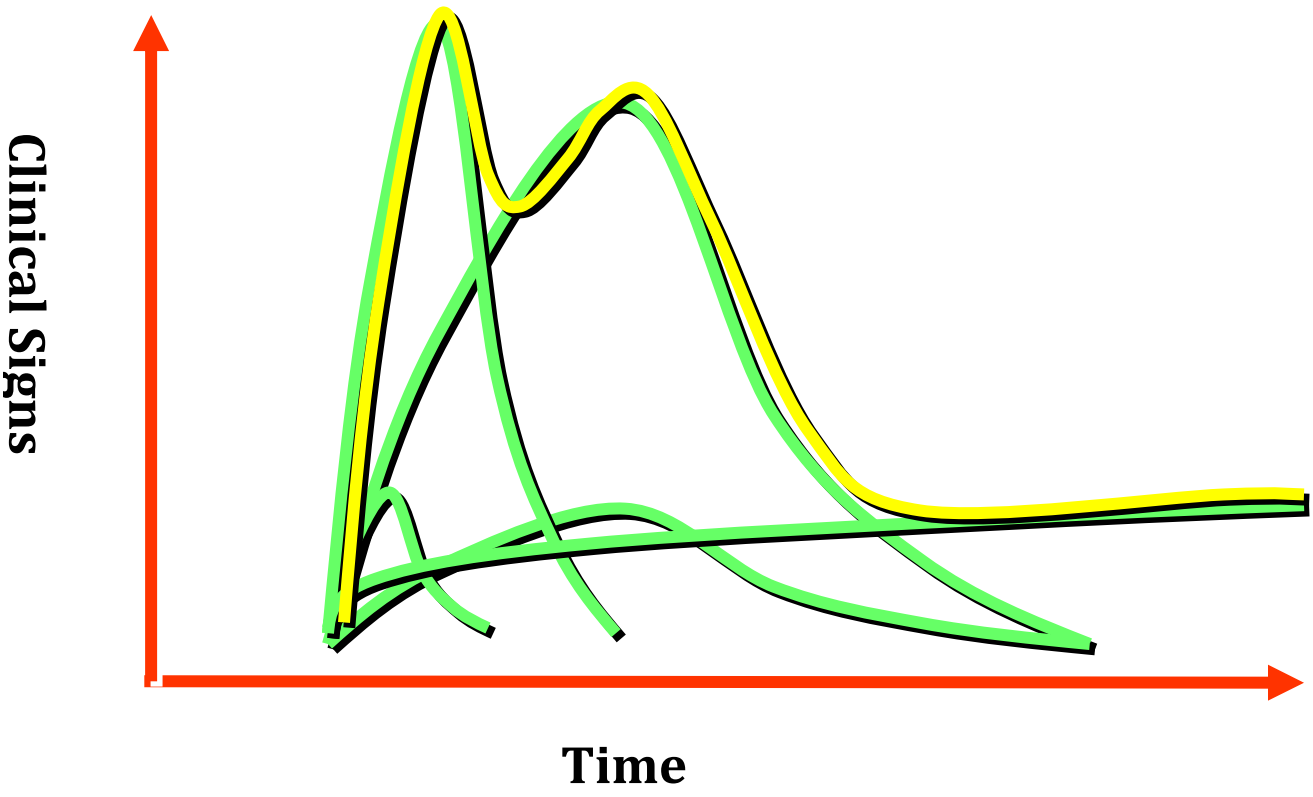
The diagnosis is often thought of in **etiologic** terms (i.e. a specific infectious organism results in a specific disease process), however, it is often more productive to think about a **pathophysiologic** process that could result in the clinical signs (i.e. If the liver is dysfunction, these would be the clinical signs that result). This is often a more reasonable approach as the clinical signs most often reflect organ dysfunction, rather than specific etiologic processes. Once the location of the pathophysiologic process within the body is identified, specific etiologies that affect that particular organ or functional system can be considered.

The process of assimilating all of the pieces of clinical information and then search your disease characteristic database (in your mind) for matches if often viewed as the "art"

of medicine. However, solving medical unknowns such as what disease a patient has is basically no different than other problem solving mental processes that human being use to in other aspects of life.

Disease patterns and their effect on clinical observations and interpretation

Rodney S. Bagley DVM, DACVIM
(*Neurology and Internal Medicine*)
Professor, Neurology and Neurosurgery
Washington State University, College of Veterinary Medicine

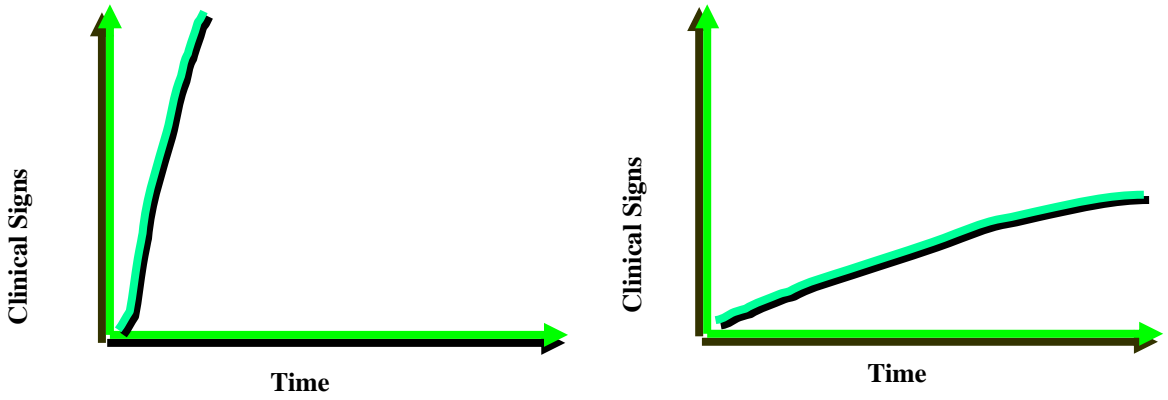


The discovery and understanding of disease is the focus of clinical medical evaluation. Unfortunately, the nuances of disease are based on a complex array of factors pertaining to the disease process itself and to the reaction/response of the individual to the disease. The third factor is the clinician that is observing the disease in an individual and the dependence upon their knowledge, experience, and personality for diagnosis and treatment.

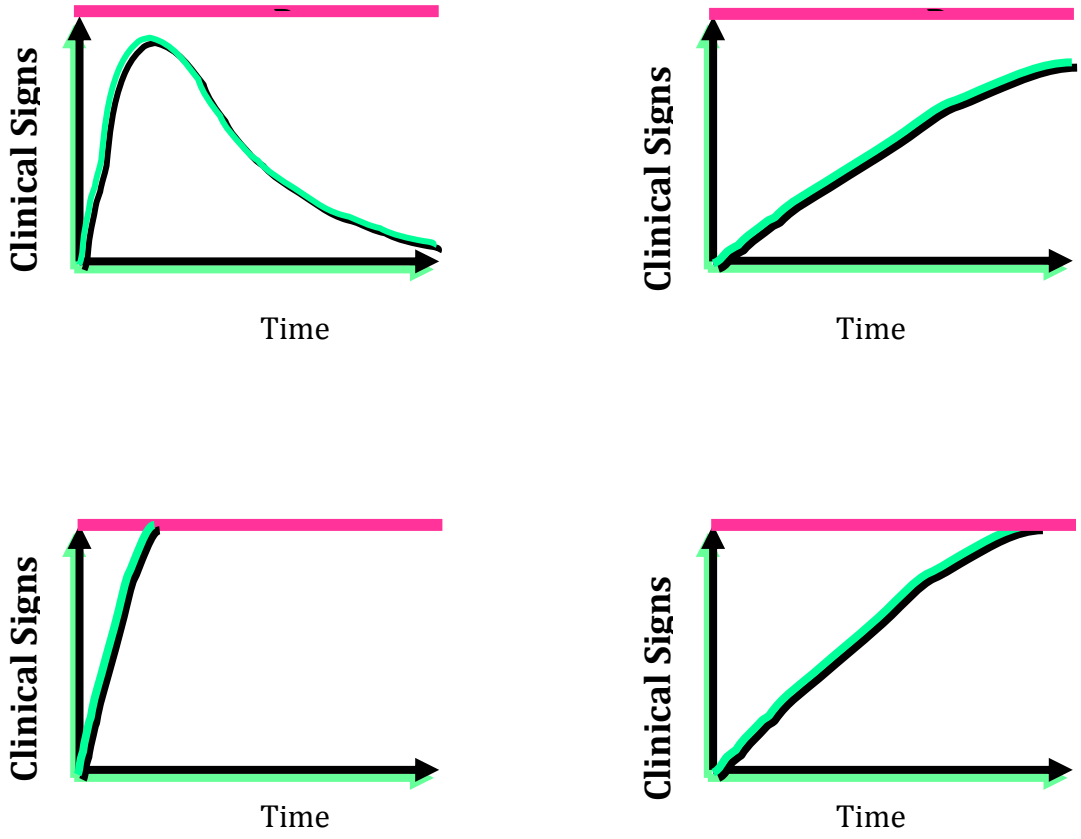
Disease entities can have a variety of clinical courses. A knowledge base of typical disease patterns and disease characteristics over time are important factors in determining if a disease may be present in an individual. Characteristic clinical signs and physical diagnostic clues are also imperative to determine. These coupled with the experiences of the examiner are important in finding the ultimate disease process.

Specific diseases ideally will follow a stereotypic pattern with regards to onset, progression, or resolution within a group of affected individuals. Important aspects of the disease course are its rapidity of onset, the progression, and the clinical duration. Some

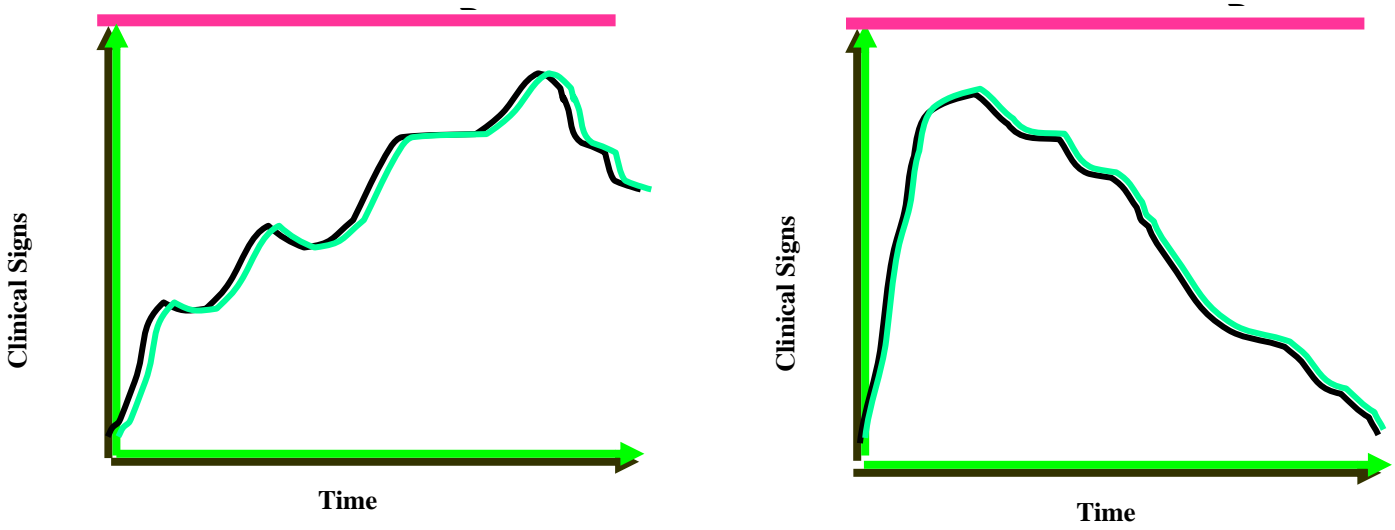
diseases, for example, begin acutely and progress rapidly. Other diseases build with time and progress less rapidly.



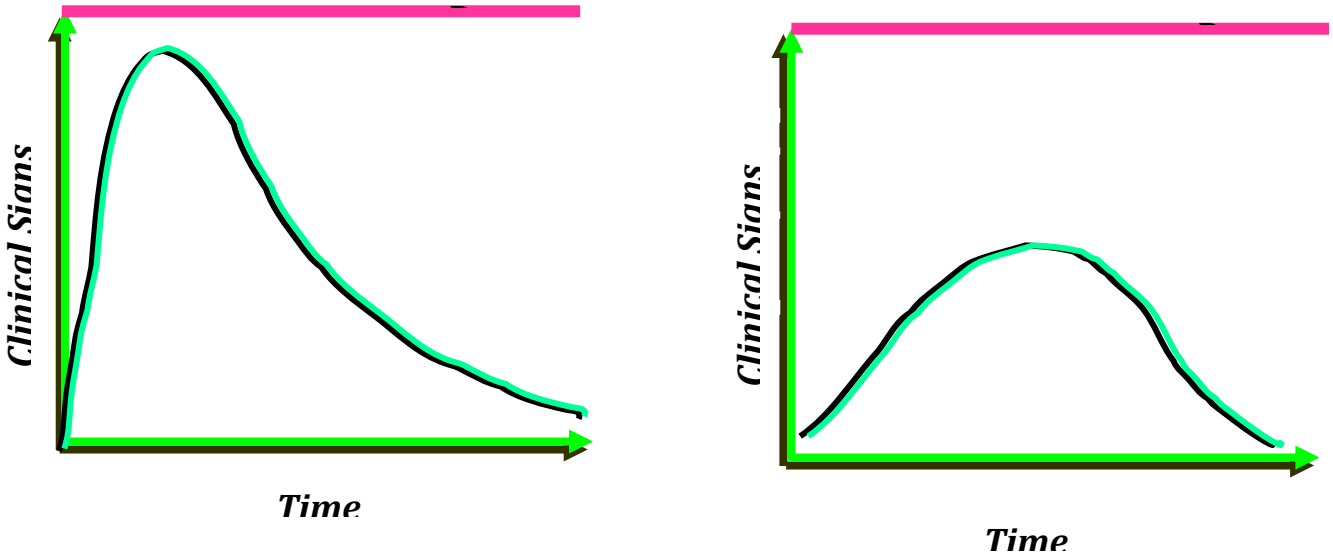
In some instances, disease will improve, and it others it will remain persistent. In still others, the disease will result in death of the individual.

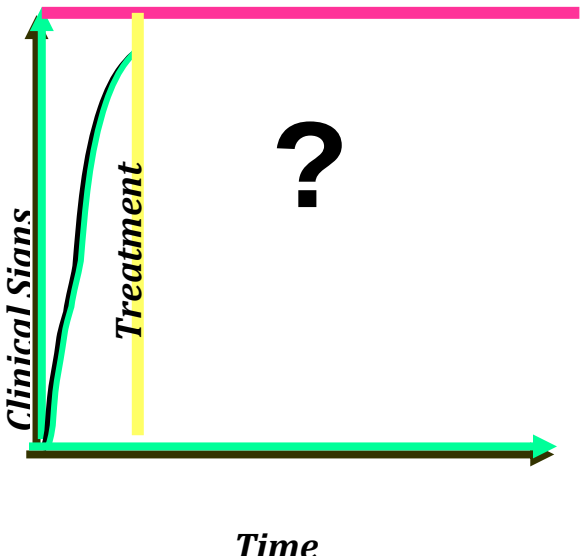


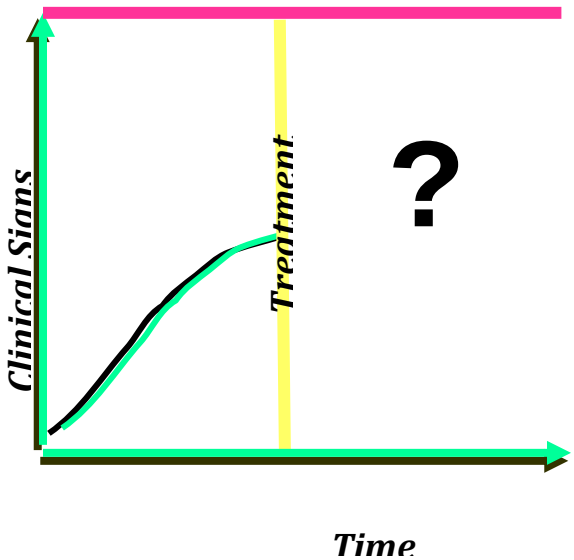
Unfortunately, clinical disease is influence by numerous factors, which similarly influences the clinical progression of the disease. Some of these factors depend upon the disease itself, but as importantly, the body's response to the disease. While a list of these factors is expensive, the clinical effect becomes a sometimes convoluted, erratic, irregular disease progression.

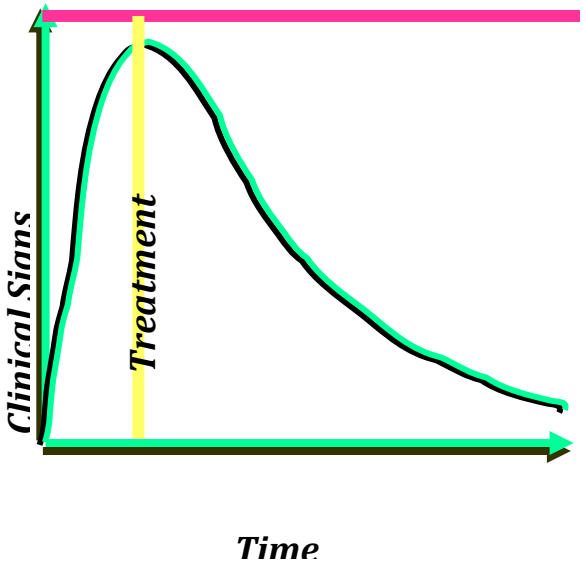


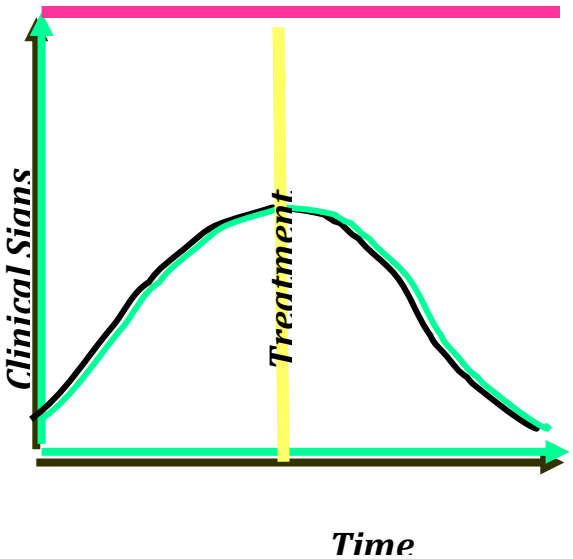
Obviously, then disease courses are not always stereotypic. Predicting the natural history of the disease is, therefore, one of; if not the most important foundations that clinical interpretation of response to treatment is based upon. As it should be obvious that this information is not available in each individual patient. This should strongly be considered when assessing apparent improvement following treatment.



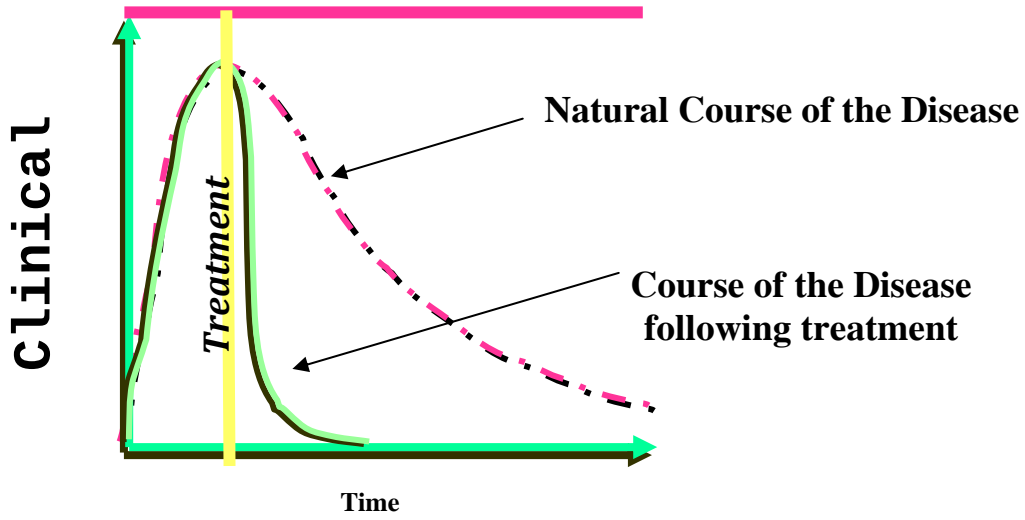

Clinical Signs
Treatment
?
Time


Clinical Signs
Treatment
?
Time

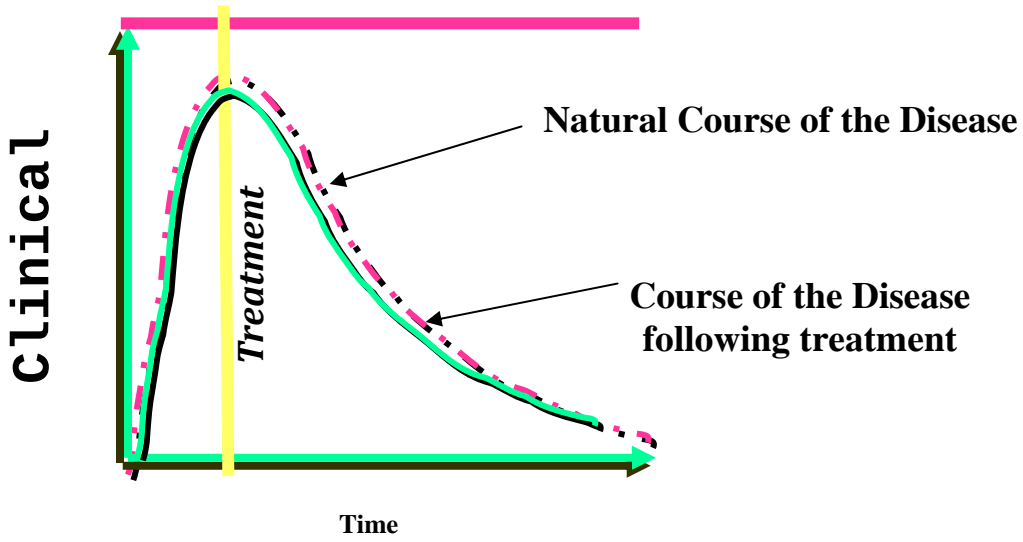

Clinical Signs
Treatment
Time


Clinical Signs
Treatment
Time

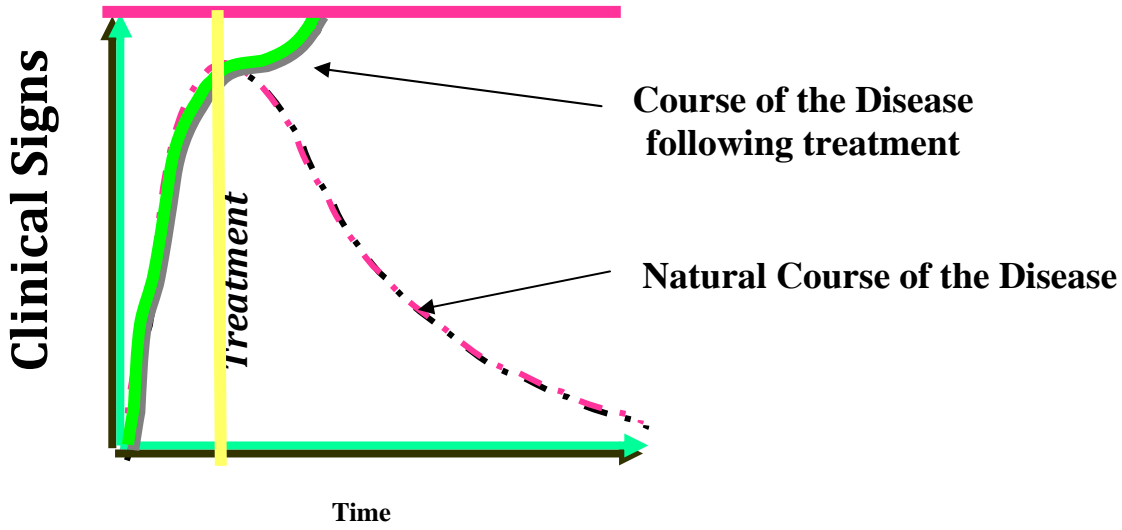
If the disease progresses after treatment in a similar manner to how it would if it is untreated, then, we would conclude that the treatment had no effect on the disease outcome. This could result from an ineffectual treatment, or an inappropriate treatment.



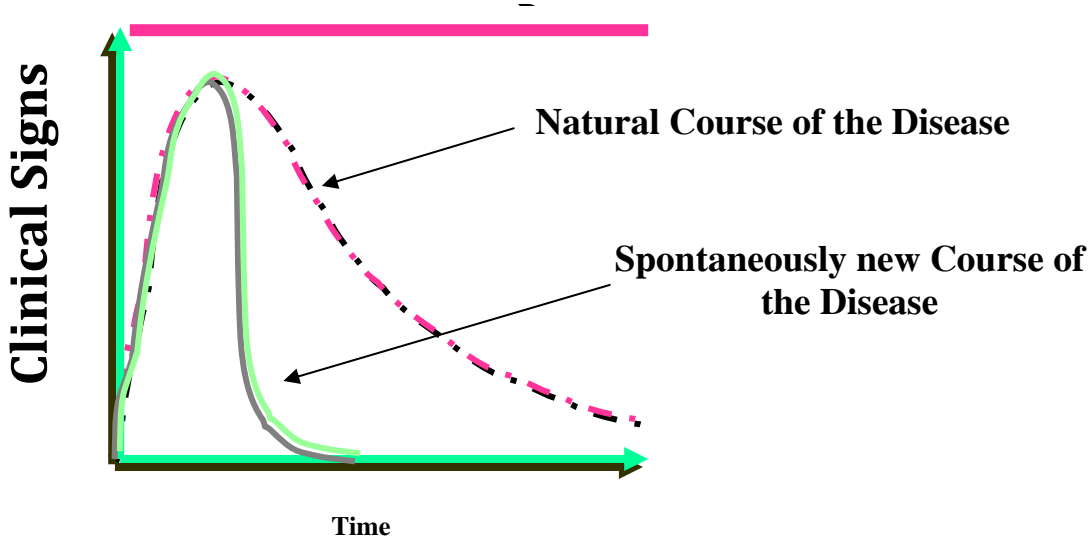
If, however, the clinical course of the disease was altered and improved, we might conclude that the treatment was effective.

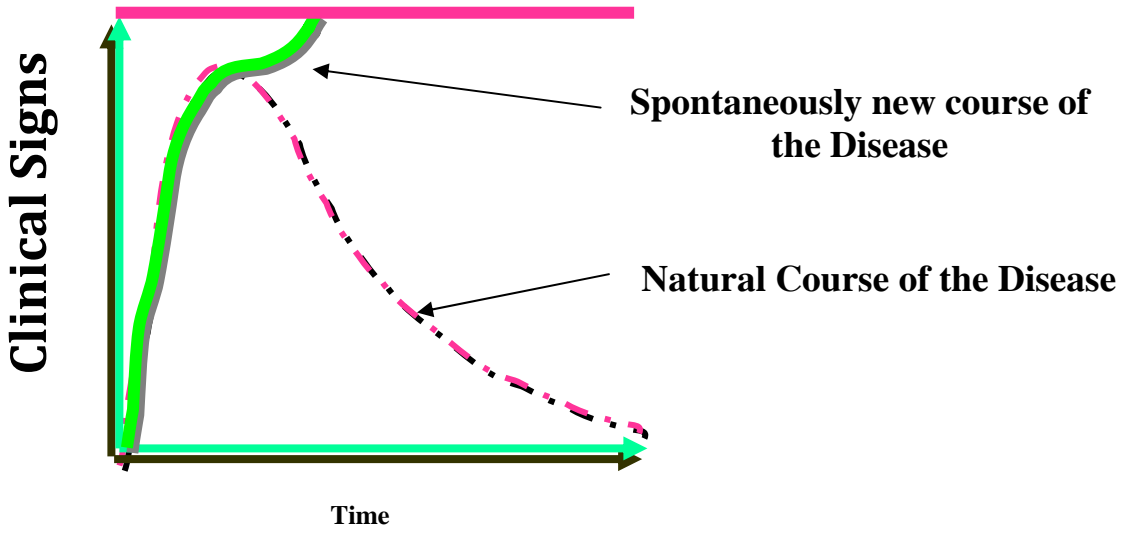


If the natural course of the disease worsened, then we would conclude that the treatment might, in fact, be harmful.

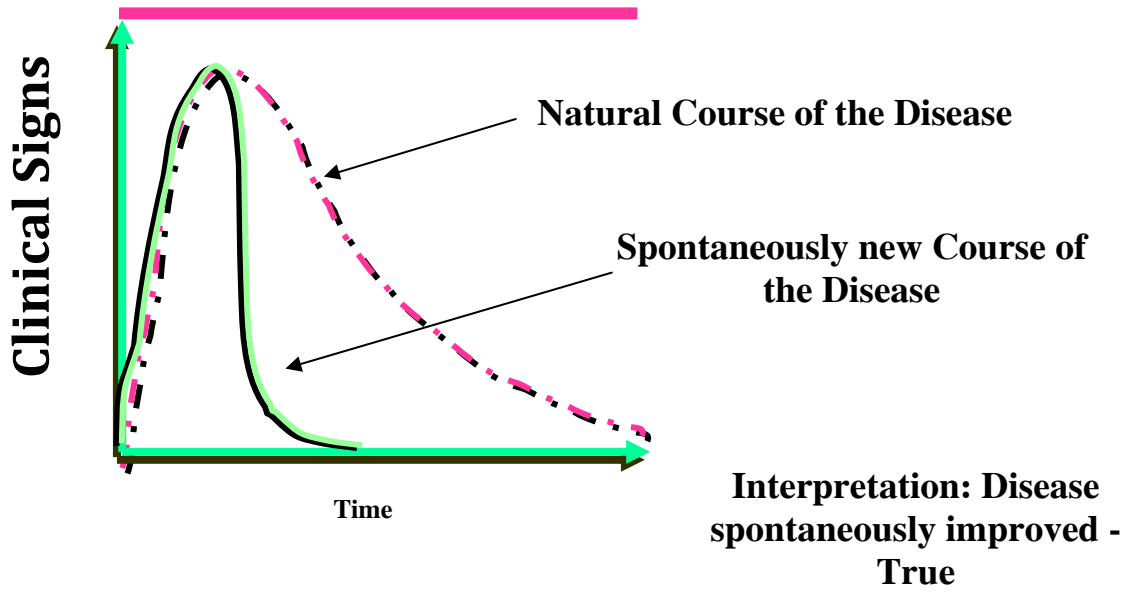


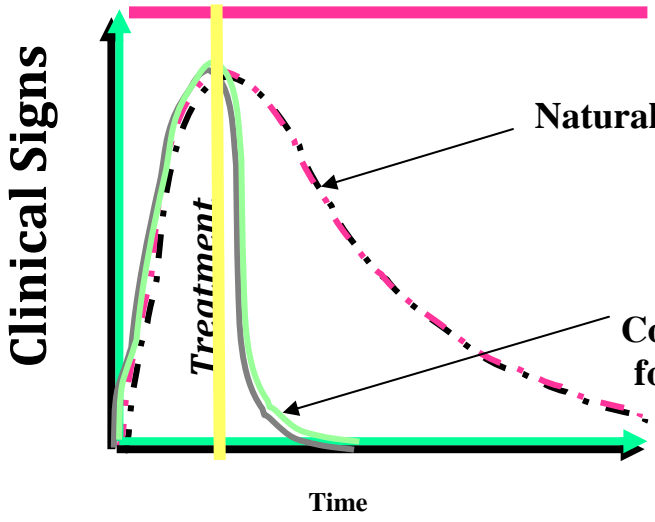
As we have established that clinical disease does not always follow a stereotypic pattern, alterations in the course of the disease may not be dependent on the variable that has changed. The typical disease course may spontaneously change.



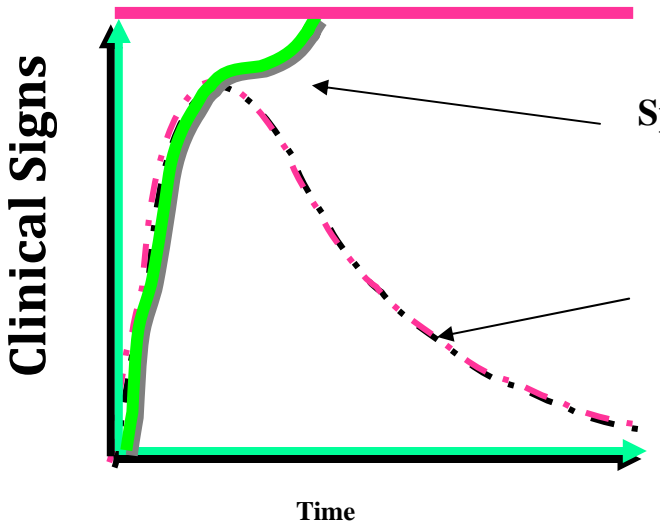


Obviously, if the typical course of the disease spontaneously changes concurrently with treatment and this new spontaneous disease course mimics that which would typically seen with a treatment effect, we may misinterpret the clinical response to treatment.

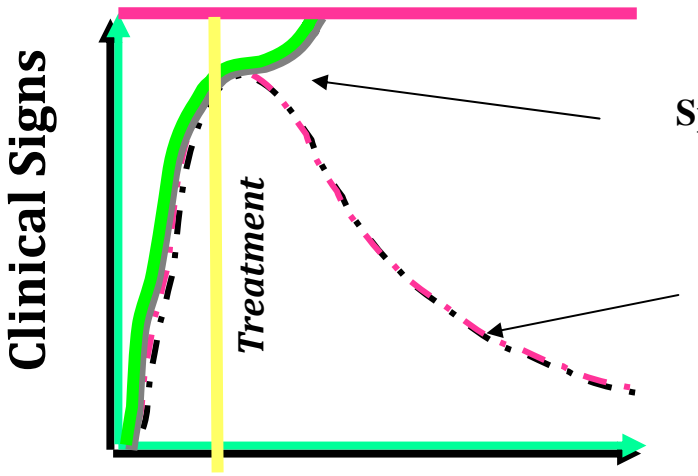




Interpretation: Disease improved because of treatment - False



Interpretation: Disease spontaneously worsened - True

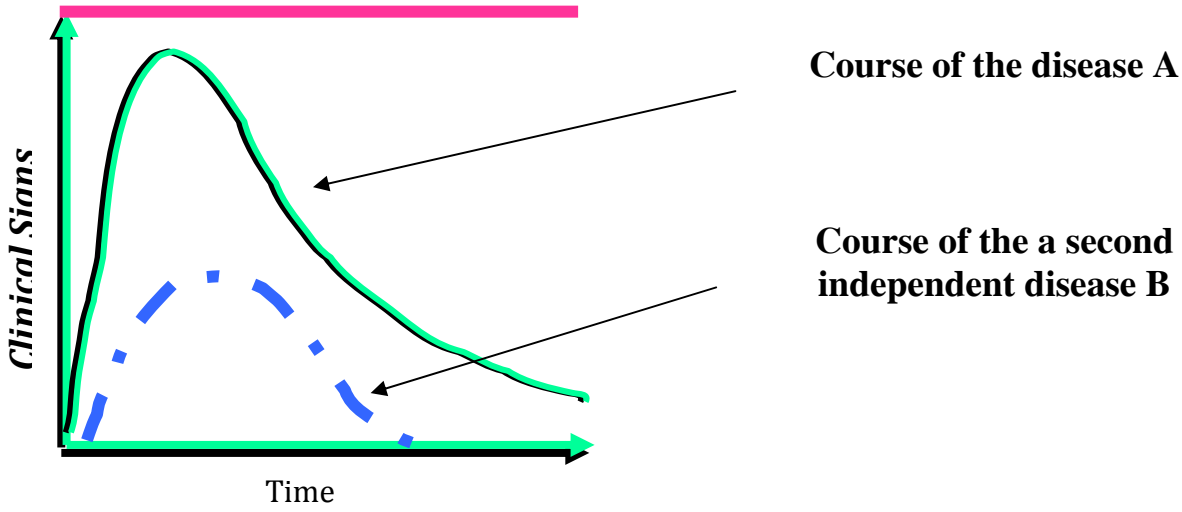


Spontaneously new course of the Disease

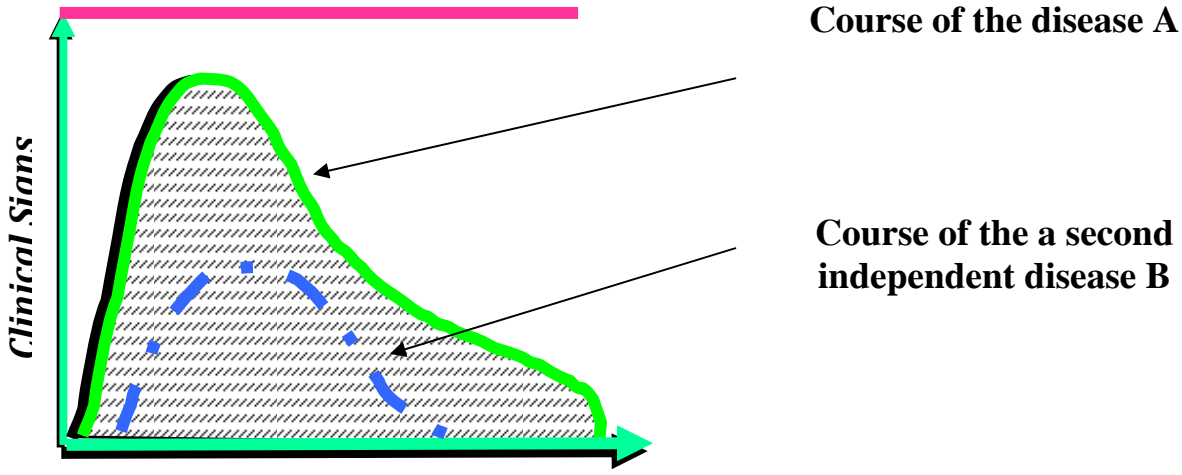
Natural Course of the Disease

Interpretation: Disease worsened because of treatment - False

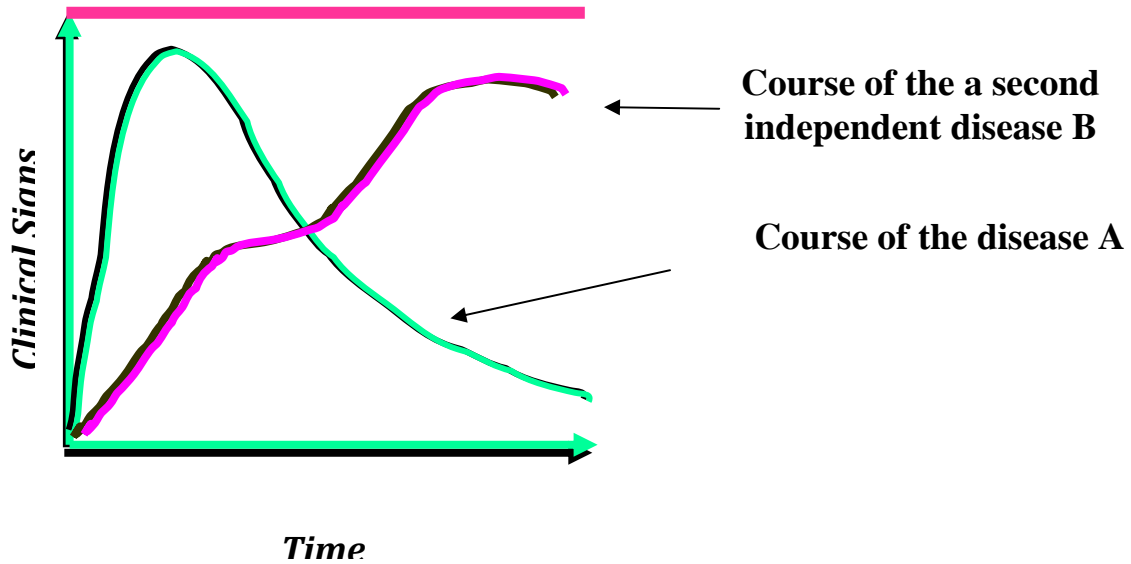
These examples are simplistic representatives of single disease in a given individual. In some instances, however, more than one disease process occurs either independent or concurrent with another disease process.



In some instances, this second disease will be overshadowed by the clinical signs of the other disease.

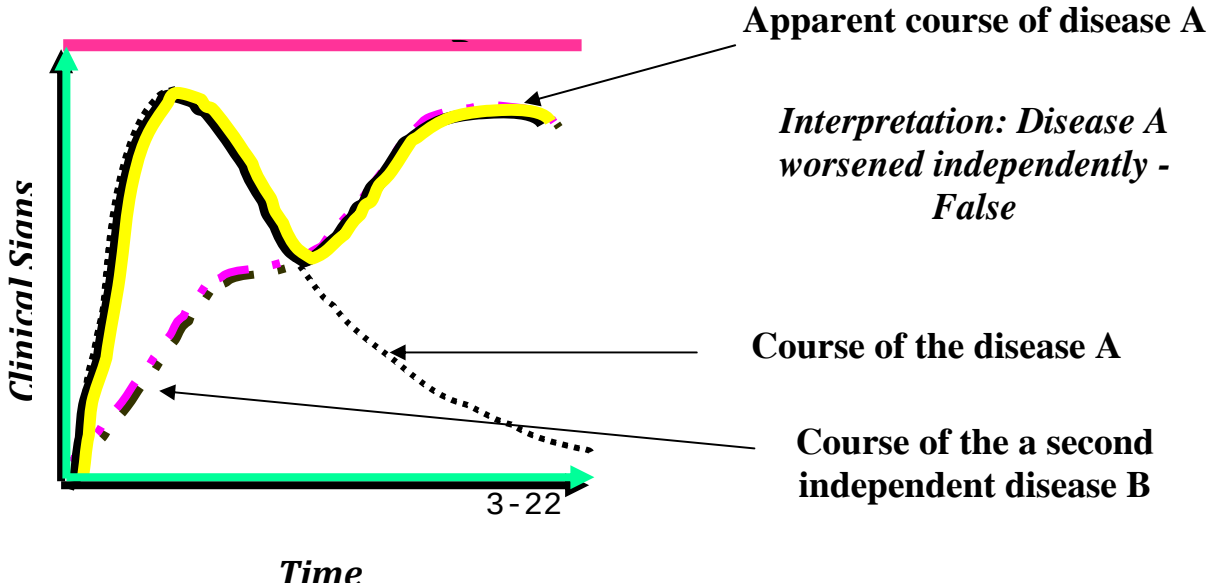


In other situation, the course of the seond disease will be different enough from the other disease process to alter the course of the illness.

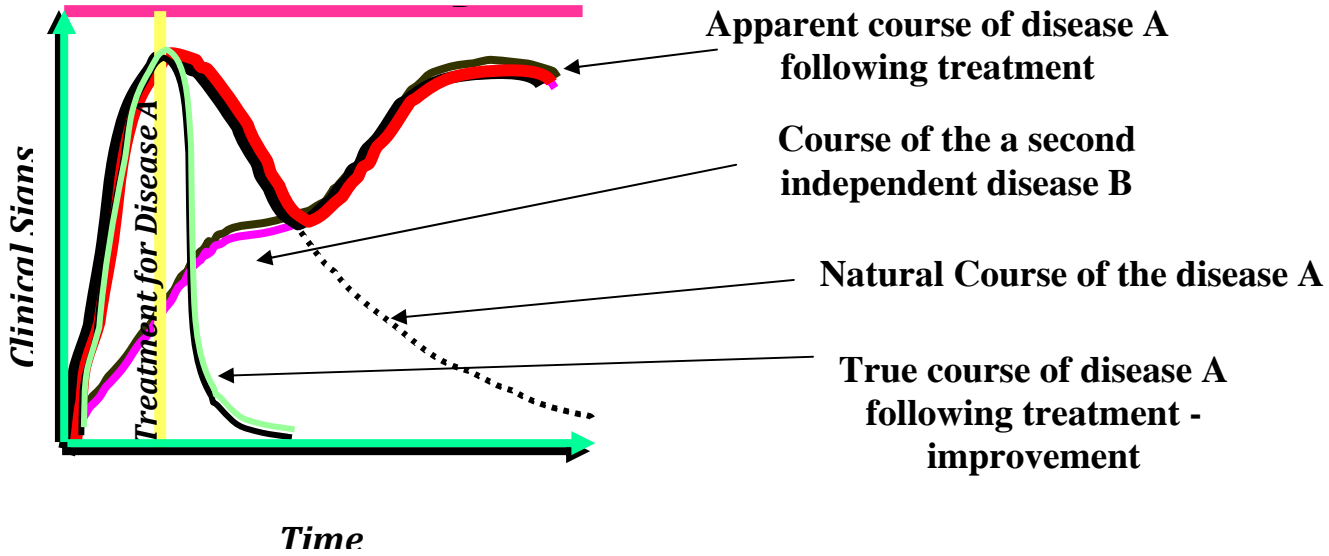


If the clinical signs and course of these diseases are different, they hopefully will be recognized as independent diseases with independent disease courses.

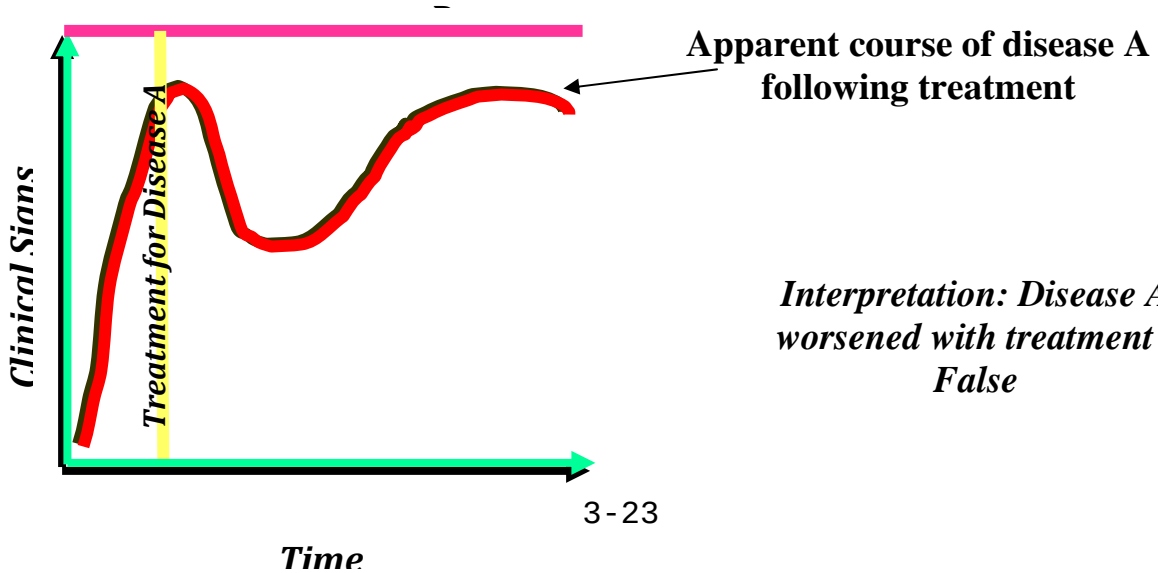
If these diseases have similar clinical manifestations, and the 2 independent diseases are recognized as the same disease process, however, the clinical course of the recognized disease may appear different. For example, if disease A has a certain clinical course, which differs from a second, independent disease (disease B), however, the clinical signs of disease B are similar or the same as course B, when observed in an individual, the course of disease A might be misinterpreted as something different than its natural disease course.



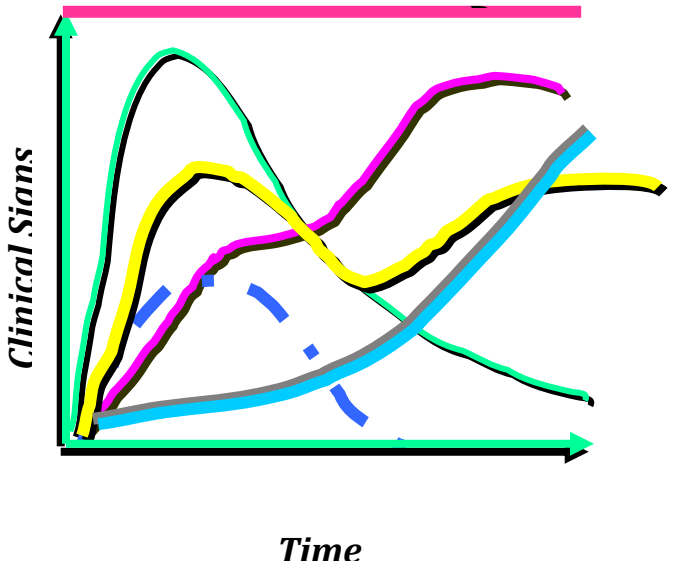
If an appropriate treatment is given for disease A, however, not for disease B, disease A may improve, but disease B may not. If the diseases are not diagnosed as separate entities, the response to treatment of disease A may not be recognized, and it may be falsely concluded that no treatment effect occurred.



If these separate disease patterns with treatment are not recognized, response to treatment will be misinterpretated.



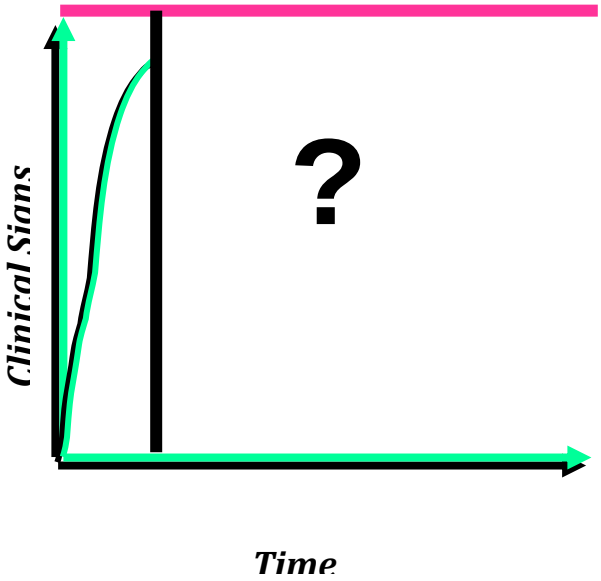
The determination and assessment of treatment effects becomes increasingly difficult when multiple disease processes are present.



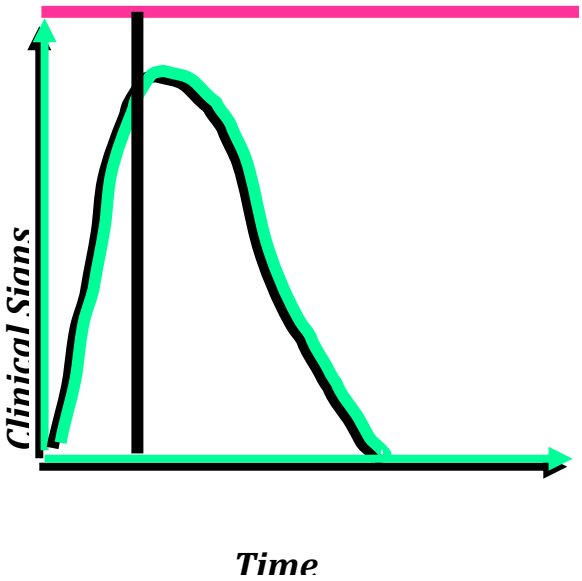
Differing Courses of the multiple disease processes

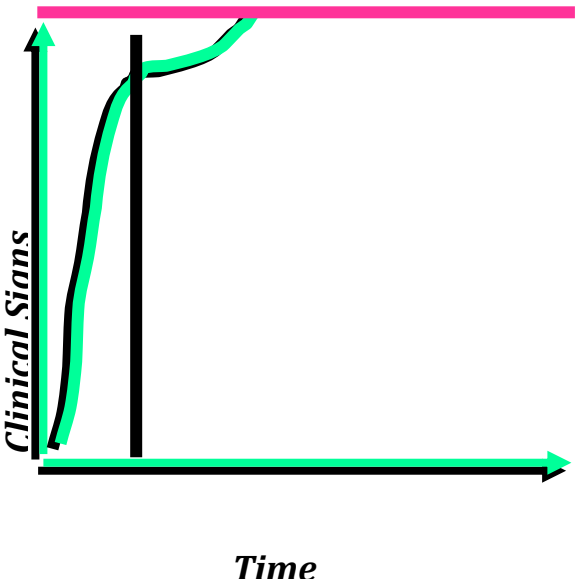
It should become apparent from this information that there are important key elements in disease diagnosis that need to be accurately assessed. One is the acutal disease process present (the true diagnosis). The cornerstone of accuate diagnosis is a complete knowledge of the clinical characteristics of a disease process including those that are specific for the disease and those clinical characteristics that are shared with other diseases. This aspect includes separation of multiple disease processes. Another important element is the predicted clinical course of the true disease. Both of these features can be influenced by an uncountable number of variables, making the nuances of a single disease in a single individual a truly unique entity. A third important aspect is the emotional involvement of the clinician, which can alter the interpretation of the true facts present. This aspect is magnified when the clinician lacks knowledge of the disease or lacks information about what actually happened to the patient.

For example, if a patient is initially examined, however, the disease progress is not further evaluated ("lack of follow-up", "lost to follow-up"), and then valuable information is lost regarding the disease process.

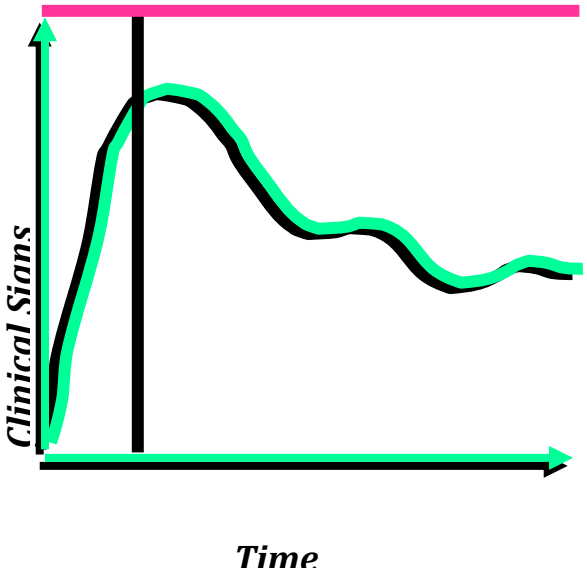


A least two obvious explanations exist in this situation. One is that the patient got better, the other is the patient got worse.

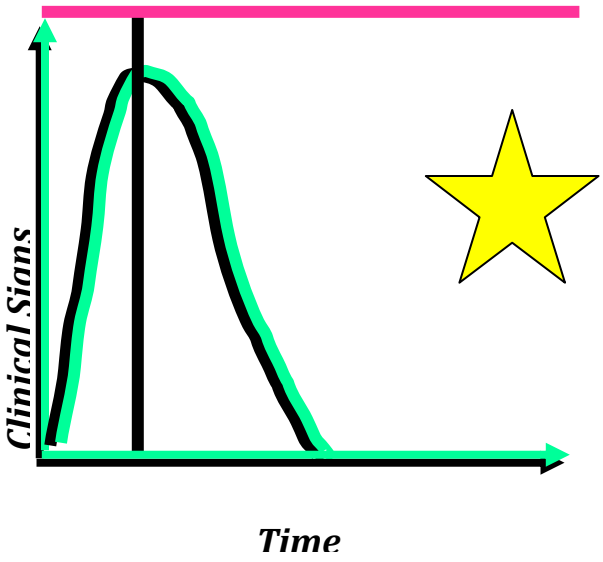




A third possibility is that the disease persists at some level of involvement and the individual is chronically affected.

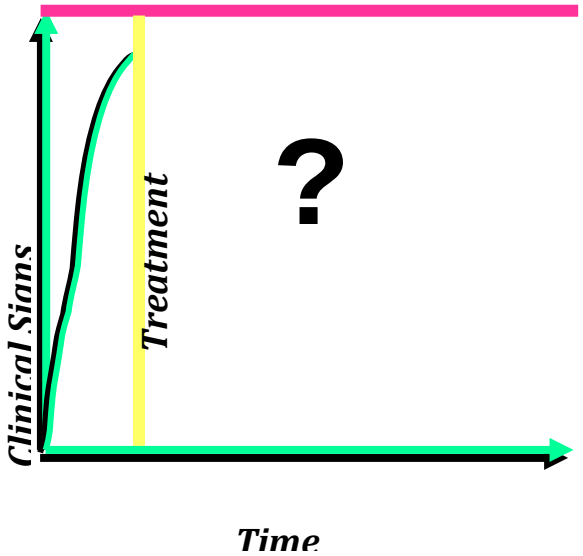


As most clinicians want the patient to be better, if the patient does not return, the clinician often assumes that the patient improved or was cured.



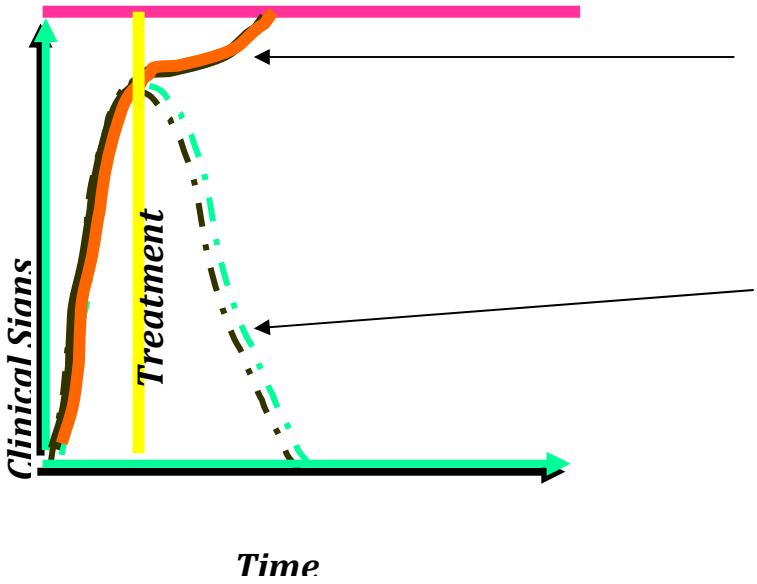
Assumed improvement without objective assessment

Lack of follow-up information becomes troublesome when trying to assess treatment responses.



Again, if a treatment is administered and response to treatment is not objectively quantified, treatment responses are impossible to assess

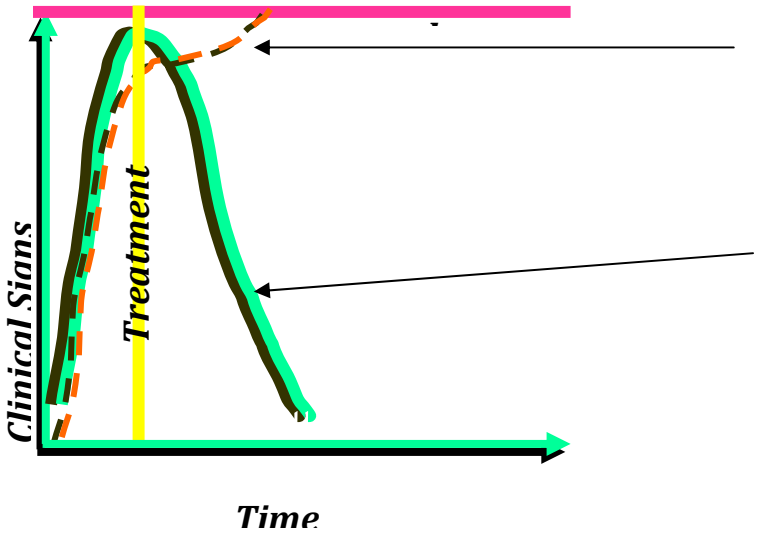
If the patient does not return for objective follow-up assessments, false conclusions may be made about treatment affects, both positive and negative.



Actual patient outcome - worsened

Assumed patient outcome - improved

Interpretation: Disease improved with treatment - False



Assumed patient outcome - worsened

Actual patient outcome - improved

Interpretation: Disease worsened with treatment - False

In conclusion, then, there are a number of factors to consider during clinical assessment of patients with disease. Some of these aspects are positive or make it easier to diagnose and treat; some are negative making it more difficult to diagnose treat.

Aspects that may enhance your ability to diagnose and treat:

- Understand fully the disease process (Knowledge base of the disease)
- Understand the common clinical progression of the disease
- Gather accurate and complete clinical and outcome assessment information
- Always consider the counter-argument (i.e. the disease apparently improved with treatment, but what if it really didn't. What factors could cause a misinterpretation of the clinical data?)

Remember that the best clinicians are always the biggest skeptics! They never trust that things are as they appear. Always consider different explanations. Look at the situation from all angles and perspectives. They can sort through the forest to find the tree!

Aspects that may detract from your ability to diagnose and treat:

Not understand fully the disease process (lack of knowledge base of the disease or inexperience. Inexperienced clinicians should realize and accept this fact, and be more diligent and aggressive in gather information!)
Not understanding the common clinical progression of the disease
Not gathering accurate and complete clinical and outcome assessment information. More mistakes are made by not looking rather than not knowing.

"Insufficient examination and inaccurate observations are more common causes of incorrect diagnoses than false conclusions from correct and sufficient facts."

(Paraphrased from DeJong 1967)