

cles, that is, the tibialis anticus and extensors have suffered more than any other groups of muscles in the small number of cases I have observed. Of course, we are familiar with the various groupings which we find in literature, as the forearm and upper arm groupings, and those things, but that seems to comprise about half of the cases. I suppose the legs and arms, are affected about equally. In the last case which I had a chance to observe an unusual distribution was present affecting one arm and both legs.

The improvement in the cases generally begins to come about in a couple of weeks after the disease has practically subsided and continues possibly under medication, massage, general treatment, etc., for possibly a year. I have not seen any marked improvement occur after that length of time.

The relaxation of the paralyzed muscles will give often a tendency to easy luxation and relaxation of the joints, which is quite

troublesome and may be so extensive as to render some sort of cast or leather retaining device necessary, in order to prevent trouble of frequent luxations and the pain associated with them.

The reaction of degeneration is valuable in the diagnosis later in the disease, but unless the disease is more or less prevalent I fear that most of us will not resort to it until such time as paralysis has already developed, in which case we are generally able to make a diagnosis without it. Lack of irritability of the nerves and lack of response to the faradic current and contraction of the muscles with the mild galvanic current is more or less characteristic. But, as I have said, I fear that most of us do not avail ourselves of this until after the diagnosis is pretty well established on a clinical basis.

Atrophy of the muscles is sometimes very marked and is dependent largely upon the degree of destruction which has occurred.

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## CHRONIC HEART DISEASE WITH SOME EARLY DIAGNOSTIC SYMPTOMS.\*

By J. H. HONAN, M.D.,  
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There is perhaps no more important subject in clinical medicine than that of early diagnosis of heart disease.

However much has been said and written to emphasize the importance of an early diagnosis in heart troubles, I make no apology for again calling attention to so vital a subject, one so full of importance and of such general interest to the family physician, to the surgeon, to the specialist; indeed, to the practitioner of every branch of medicine.

I here make an arbitrary classification to eliminate the unimportant symptoms and bring before you the more clearly and briefly

those which are essential to an early diagnosis.

This classification gives us three divisions of heart symptoms grouped in the order of the importance as a study for diagnosis.

The first, let us call "the inferred group," embracing that large group of symptoms *referred* from other organs of the body, having no connection directly or indirectly with the heart. These are referred to the heart because of the nervous impulse or on account of location of the impulse felt by the patient. The organs most accountable for these referred sensations are the stomach and liver.

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Occasionally a floating kidney, the uterus or ovaries may also be the seat of the referred heart symptoms. We need dwell on these no further than to differentiate them from the next group.

In this second group will fall that large class of symptoms that have caused such discussion among clinicians and pathologists. These are the functional symptoms for which there can be found no pathological lesion.

Pseudo cardio vascular symptoms are of intense interest to every student of medicine, whether he be devoting his time to some special branch or to general practice. The ability to classify this great group will measure the standard of the diagnostician, for in so far as he is able to differentiate the false from the true, the functional from the organic, will the ground of contention be cleared between the clinician and the pathologist?

I have neither the assumption nor the scientific basis from which to draw any sharp lines of classification, as there are many questions in cardio vascular pathology still pending, and which I fear must wait some time for definite classification.

The third group of heart symptoms may be designated as *organic symptoms*, for which there are always pathological changes in the cardio vascular tissue, changes which are physically demonstrable either macroscopically or microscopically. This group on the whole is the most easily recognized. There are, however, certain symptoms pointing to this group which are often both puzzling and taxing to the skill of the clinician to differentiate or rather to decide whether they belong to this group or in group two.

Mackenzie has shown that observations extending over some twenty or thirty years have changed his views on points of pathology in the heart muscle. Indeed, we are today in a transitional stage of cardiac pathology, when the foremost workers on this subject consider obsolete that which was yesterday given out as standard. Until the lab-

oratory worker and the clinician co-operate in a long series of observations we must wait for the final word on many of these questions.

The important thing for us as practitioners is to observe carefully what the laboratory workers have established as practical for diagnosis in blood pressure, in polygraphic readings, in electro cardiograms, in orthodiagrams, etc., etc., and apply these as far as possible in our private practice.

In attempting a classification of cardiovascular diseases, I realize that such an attempt will meet much opposition, but until some of the questions now being studied by several different observers in Europe and America are cleared up, personal opinion must necessarily prevail in deciding the place of many of these symptoms. Until pathologists and laboratory clinicians can give them a definite classification, there must remain this uncertainty. I feel, however, it is time the practitioner had some form of classification on which to base a diagnosis.

In considering diseases of cardio-vascular nature from a diagnostic standpoint, we must include in such consideration that great group of vital organs in which circulatory equilibrium is accurately adjusted, and necessarily exquisitely sensitive to any alteration in supply of blood. The functional workings of these organs are so harmoniously timed to one another that the slightest deviation from the normal in afferent or efferent vessels of the one may naturally in a short time interfere with the functional activity of the entire group.

In the hope of stimulating discussion on this important subject I am calling attention to some of the cardinal symptoms that must be recognized in the earliest beginnings of heart disease. The subject is so broad and presents so many phases that in a paper of such limitations I can only hope to touch on those of greatest moment.

I want to plead for more careful and sys-

tematic observation on the part of the general practitioner. He it is who is in close touch with the patient before and at the time when the earliest manifestations of heart weakness are shown. He alone is in position to observe the earliest comparatively insignificant deviations from the normal and study the subtle changes which lead to a loss of reserve force of the myocardium.

On the reports of the general practitioner the consultant must depend for connected changes from the earliest beginnings.

We should encourage the general practitioner in making these reports. Such papers should receive an important place on the program of every medical society, as these papers have far more practical value in diagnostic work than reports from hospital wards. It is the very early symptom, the first noticeable change which takes place, that is important.

When dyspnoea or oedema is present it is not then difficult for the average man to make a diagnosis. It is of vital importance to the patient and also to the practitioner for the latter to recognize premonitory symptoms of insidious and serious heart trouble.

The usual method of estimating normal force of the heart is by testing the field of cardiac response and judging the limitations according to the individual. As no two individuals respond alike in health it becomes a personal question of discrimination between individuals. In this matter the knowledge and experience of the family physician with the individual is invaluable.

Dyspnoea is now considered one of the earliest signs of a weakened myocardium, yet we know that when dyspnoea is present there has already considerable change taken place in the muscle fibre.

I hope the day is not far distant when every family physician will have a sphygmotonograph with which to register the blood pressure, the jugular pulse and the brachial pulse at the one sitting.

With the improved instrument this can be

done in the office at the first examination in five minutes. The instrument, which is simple, requiring little mechanical skill, gives one a graphic record of what the heart is doing as written by the organ itself.

A little study of Mackenzie's "Pulse," or John Hays' "Graphic Methods," or that excellent book just from the press, "Mechanism of the Heart Beat," Thomas Lewis, of London, will soon enable any one to interpret these readings and detect at a glance an auricular fibrillation and the significance of the a. c. interval. If the family physician would take a polygraphic record of such cases once every three months or six months in the earliest stage of the trouble it would be of inestimable value in judging the rate at which these insidious diseases progress.

Our methods of diagnosis of heart diseases have been so crude and inaccurate that a large per cent of pathological conditions have gone unrecognized. This has been shown by a number of clinicians and recently in a masterly report by Dr. R. Cabot, of Boston; before the A. M. A. at St. Louis.

There is no doubt that the electro-cardiograph, the orthodiagraph and the sphygmotonograph have come to stay. Many of the most conservative on both sides of the Atlantic are making now a routine of having their cardiac cases examined by these instruments. They have recognized that these instruments have added exactitude to their diagnosis and prognosis. They have done much more than this; they have pointed out errors in therapy, which have been invaluable as a guide in treatment. The polygraph has shown us the mischievous results of digitalis, as Lewis and Mackenzie have demonstrated.

Since His, in 1893, discovered the a. v. bundle which bears his name, there has been an entire change in the study of heart diseases. This important discovery of primary tissue bundles along which the contractile impulses travel has enabled us to approach the subject from an entirely different plane.

Extrasystoles when occurring in later life or when due to exercise only, are a significant symptom of heart weakness. These need not be confounded with the extrasystoles of the neurosthenic type which are functional. The polygraphic tracings often give us the first indication of auricular fibrillations, extra systoles, pulsus alternans changes in the a. c. interval, all pointing to functional disturbance which may be very significant in making an early diagnosis.

Endovascular pressure has for its cause three important factors, namely, heart force, peripheral resistance and the viscosity of the blood. This naturally excludes hypertension, due to nervous rigidity.

In considering blood pressure as a diagnostic symptom we must carefully study causal factors before jumping at conclusions, for it is only after a most careful analysis of all these factors that one is able to give blood pressure its proper significance as a diagnostic symptom.

Arterio-sclerosis holds a pathetic interest for the medical profession as in no walk of life is the per cent of life mortality so great as in that of the practice of medicine. The peculiarity of the physician's life, the irregularity of his hours, the intense strain he must often undergo for hours and hours at a stretch, the loss of sleep, the constant appeal to his sympathies, that brain-racking feeling that something more might have been done for his patients; these are more than sufficient causes for the medical practitioners' heavy tax in arterial degeneration, and I am convinced the mortality per cent here given is very conservative for the actual mortality of this disease in the medical profession. It is my experience, and I think the experience of most consultants, that arterio-sclerosis is increasing rapidly in general, particularly in the medical profession. Records show more than 60 per cent of the physicians who have submitted themselves to examination are suffering from some form of arterial disease. Sixty-two and five-tenths per

cent of the physicians on my case records show a vascular disease in some form.

We have learned to regard high arterial tension as a valuable diagnostic sign which may indicate a number of morbid conditions having usually as a causal factor the absorption of toxins.

High arterial tension *per se* does not require drug treatment, but where it continues for some time we should insist on correctives, as regulated diet, refraining from some bad habit, easing up on business hours, etc. Though a high blood pressure may continue for years without any untoward symptoms I consider a pressure of 180 M. M. H. g. or upwards as an unfavorable prognostic sign.

Valvular diseases and defects are perhaps the easiest of all heart diseases to diagnose. Their interpretation, however, calls forth the widest divergence of opinion among medical writers.

The tendency heretofore has been to attach a much more ominous significance to valvular defect than was due them, and no doubt many patients have unnecessarily suffered tortures from fear of sudden death, due to false or erroneous interpretation of a valvular murmur.

I fear the pendulum is today swinging too wide in the other direction, and serious mistakes may be made by the younger and less experienced men in the profession, because of the writing of many very good diagnosticians, some of whom speak as lightly of a simple valvular defect as if it were nothing more than the loss of a tooth.

One might infer from some of these writings that a valvular defect is in no way an indication for the slightest restriction in physical exercise; that a man suffering from a mitral stenosis *per se* might with perfect impunity enter the marathon races, contest for records of mountain-climbing or perform any Herculean test of strength. Records show that patients with simple valvular murmurs may live comfortably for many years, while following the ordinary vocations of life, with-

out involving any risk of serious heart trouble. I have three such cases now under observation, one of which I have spoken of elsewhere. Two of these cases have had leaky valves for ten and twelve years, respectively, without any indication of loss of reserve force of the heart.

I believe until the average general practitioner becomes more familiar with the causes of heart murmurs and can more readily differentiate between pseudo and organic, between a functional and a serious, between a simple valvular defect and an insidious progressive valve lesion, we should be more conservative in our public utterances and writings. Often the history in these cases is shrouded in obscurity, and we are unable to ascertain the approximate date of the causal factor or exciting cause, and hence cannot calculate the time required to bring about the condition found on examination. It is therefore possible only after continued observation extending over considerable time to give a positive diagnosis and a reliable prognosis.

Among the very early symptoms of weak heart is a distress or pain in the right hypochondriac region. This distress or pain is often the first indication the patient has of any trouble, and is usually the cause of his seeking medical advice.

The sensation complained of by the patient is more often a distress or uncomfortable feeling located from the right nipple to below the last rib.

Examining the region one finds a congested liver and portal veins, the lower border of the liver often extending two to four finger widths below the last rib. The liver capsule may be so distended as to be very sensitive to pressure. The congestion in the portal veins and the pressure due to it may cause a general discomfort and the patient not infrequently refers the whole trouble to the stomach. When the liver capsule becomes stretched there is then pain and disturbed liver function, which, if not arrested, goes on to cirrhosis, ascites, cy-

anosis, stasis of the right heart and cardiac failure. Frequently before the congested liver has reached this advanced stage, there is sufficient pressure against the diaphragm and lungs to cause embarrassment of the lung excursion, naturally occasioning encroachment on the already enfeebled heart.

Dyspnoea is usually the first symptom observed by the patient, and but too often ignored by patient and doctor until other and more serious symptoms arise. If there were some accurate means of determining this insidious disease at the onset many valuable lives would be saved.

By studying cardiac dyspnoea, which is naturally a myocardial symptom, depending on the actual condition of the muscular tissue for its beginning and intensity, the amount of exercise and the intensity of the dyspnoea we may judge with some degree of accuracy the condition of the myocardium and its capacity to maintain the normal circulation.

In our examination in these conditions we must take cognizance of the condition of the lungs and first reassure ourselves there is no bronchitis, infarct, bronchopneumonia, hydrothorax, or emphysema.

Every case of dyspnoea, no matter how slight, deserves the most careful investigation and when we have cardiac dyspnoea to deal with we should give it *very careful* consideration, for we may be sure of *this* that so long as the causal factors are present and active the condition will continually progress.

Dyspnoea is not only the first symptom, but it is the most constant and by far the most important symptom of myocardial weakness, and according to its great diagnostic significance it is entirely too little studied and understood.

Cardiac dyspnoea appears in two forms, one due to exercise and the other, the paroxysmal form, or the so-called cardiac asthma.

The first is an isolated form, due entirely to the inability of the heart muscle to meet the extra demand, even on slight exercise.

This form of dyspnoea is entirely dependent on the weakened heart muscle and if the integrity of the myocardium be restored the dyspnoea is at once relieved.

The second or paroxysmal form is due to a diseased condition of the blood vessels of the heart and their temporary inability to supply the myocardium with the proper amount of blood, or it may be due to the peripheral resistance being so great as to cause temporarily a relative or absolute myocardial insufficiency. Either form may be classed as a symptom of latent heart weakness.

We here see that causes of this important manifestation may be *intra-cardial*, as loss of natural reserve force of the heart muscle, or it may be *extra-cardial*, as increased peripheral resistance.

Any disturbance of respiration has a marked influence on the blood current and on metabolism and indeed for every organ and function of the body.

Cardial dyspnoea has been studied by many careful observers, among whom may be mentioned Krehl, Romberg, Kraus, Welch, Cohnheim, Kussmaul, Neusser and others. There have been many theories advanced without entirely removing doubt from the pathogenics. I am of the opinion that the paroxysmal form is due either to inability of the right heart to force the blood through the lungs, thus causing a want of blood in the organs and central nervous system, or that the embarrassment of the left heart is so great as to incapacitate it for supplying the normal amount of blood to the respiratory center, due more to lack of quantity than to quality. Brain anemia often occurs in cardiac asthma, causing vertigo and collapse. Either of these theories leaves the primary cause in the myocardium.

Dyspnoea is usually met with in the form of tachypnoea combined with polypnoea, as the lungs in almost all cases of cardiac dyspnoea are inflated or enlarged.

Again we find the dyspnoea only manifested as a slight added effort to maintain the func-

tion with no increase in the frequency. Indeed, in the very early stages of myocardial insufficiency I have noticed much oftener the added effort in breathing than the added frequency. This I believe to be pathognomonic of the intra-cardial form of dyspnoea, as I have never observed it in the extra-cardial form. These conditions can be studied only under carefully regulated exercise. By such observations one may soon determine if the dyspnoea is due to a transient myocardial insufficiency, or whether it be constant and progressive.

The progressive form soon develops orthopnoea, at which time the rest force of the heart is becoming exhausted and true heart failure is present. The paroxysmal form or cardiac asthma is an evidence of the more advanced stage of myocardial insufficiency, and may be due to a relative or to an absolute insufficiency of the left ventricle, while the right ventricle is entirely undisturbed in its functional activity.

Arterio-sclerosis and interstitial nephritis are almost the sole causal factors in producing cardiac asthma. In this form the pulse may be quite regular and fairly strong, but not strong enough to overcome the peripheral resistance of the diseased vessels. The blood pressure and wiry pulse will give an indication to the diagnosis.

Arterio-sclerosis is such an insidious disease and often so obscure that in the great majority of cases an early diagnosis is impossible. It is a disease of as vital interest as any in the whole category of medicine.

I believe if it were possible to secure statistics of this disease in the well-to-do, we would find that forty per cent of this class of society die as direct or indirect result of this trouble. Some one has truthfully said that "more wise men than fools are affected." This is essentially a disease of the thinking portion of mankind, the strenuous life taking a heavy toll annually for the distinctions won by such a life.

We should never lose light of the cogent

fact that we may have a serious heart condition without any increase in the size of that organ, and with practically no alteration in the action.

Because of the difficulties in diagnosis and of the special clinical opportunities I have had in observing the first symptoms of exhaustion of the work force of the heart I have elected to bring some of the most important symptoms before you for study.

Another very practical reason I have in making this classification and confining my paper to a study of the work force only, is the great importance of an early diagnosis of the first manifestations of heart weakness. An *early* diagnosis is of *vital importance* to the *patient*, for it means that if proper treatment be instituted the insidious disease process may be checked and the patient enjoy a prolonged and comfortable life.

### SOME INTERESTING CASES OF BRAIN SURGERY.\*

By JERE LAWRENCE CROOK, A.M., M.D.,  
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The subject of brain surgery has always been of special interest to me, due largely to two reasons. In the first place because although injuries of the brain attack the very citadel of life, itself, yet the results of operation in this region have not been as brilliant as elsewhere, thereby stimulating one's best efforts for improvement; and in the next place it has fallen to my lot to have a rather large proportion of these cases come to me for operation, and their variety has covered a wide range. It has been my privilege to present papers on this subject several times, in all of which I have stated with emphasis some few points regarding what I conceive to be the attitude of the conscientious surgeon toward this type of injuries. In the first place, injuries of the scalp and skull should always be approached by the surgeon with every facility for doing radical, thorough, and aseptic work. Again, one should not wait for symptoms of intra-cranial injury to present themselves before resorting to operation. Injuries to the brain call for promptness, as well as preparedness. To wait for symptoms is to let slip the golden opportunity for doing effective work. The diagnosis should be made at the first operation, and as stated before, one should be

ready to do anything that may be indicated when he lays open the scalp and exposes the field of injury. Nothing short of absolute knowledge of the conditions present should satisfy the conscientious surgeon. Therefore I hold and have stated on several occasions that when a patient presents himself with an injury to the head the surgeon should operate at once, and determine whether or not there be a brain injury. If there be a wound in the scalp, the head should be thoroughly shaved and the wound enlarged so that there need be no doubt whatever as to whether or not a fracture exists. Should there be no wound, but simply a hematoma to the scalp, and the surgeon is not convinced of the absence of a skull injury, he should incise the hematoma under strict aseptic precaution, and examine the skull with his eye, and fingers in rubber gloves. A strict adherence to this policy will forever preclude the possibility of the surgeon having to treat cases of traumatic epilepsy in after years, due to neglect at the time the injury was first treated.

Without entering further into this important subject, I shall content myself with reporting briefly four interesting cases, three of

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