

AN
INAUGURAL DISSERTATION
ON

THE PULSE

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BY

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The Pulse.

In treating of this subject it shall be my purpose to attempt to describe its different characters and indications, so far as they are of practical interest, also the various causes which exert their influence over it, and the manner in which it should be examined.

The term is derived from the Latin word Pulso, I beat. We understand by this, the beating of the arteries produced by the afflux of blood propelled by the heart in the contraction of its right ventricle.

Merely for the sake of convenience, the radial artery is generally chosen to detect the precise character of the pulse. These characters relate to the number of pulsations in a given time; to their degrees of quickness, hardness, fulness, strength &c; to the equality or inequality either of

The pulsations themselves or of the intervals between each pulsation. We judge of these different characters of the pulse by the impressions produced in the finger placed on the artery.

The pulse varies with the age of the individual, climate, the time of day, position &c. It is more frequent in infancy than in more advanced age. At birth the average number of beats in a minute is estimated at a hundred and thirty to a hundred and forty; during the first year, the limits are a hundred and eight to a hundred and twenty; during the second year it varies from ninety to a hundred and eight; the third year, from eighty four to ninety; from the fourth to the sixth year it is nearly the same; during the seventh year, it is generally about seventy eight; from the twelfth year it differs but little from that of adult age; which is estimated

at sixty to seventy two, according to the constitution of the individual. The common standard of the healthy adult pulse, may be placed at sixty to seventy five beats in a minute. From forty five to sixty, the pulse gradually becomes slower, after which period of life, it is said to rise again in frequency.

The above estimate of frequency is an average of the healthy pulse, liable, however, to many variations, for we see many aged persons whose pulse is rarely higher than forty five to the minute. There is a difference in the average pulse of the two sexes, that of the female being more frequent than that of the male: The pulse is also more frequent in warm, than in cold and temperate climates; it is slower in the morning than at other times of the day; accelerated soon after dinner and slower when the individual is asleep. Bodily exercise, as running, jumping, leap

ing, or ascending a flight of stairs, accelerates the pulse, by the pressure of the muscles upon the veins propelling their contents with greater velocity toward the right side of the heart, and the heart contracting more frequently in proportion, as it is more rapidly filled with blood.

The pulse is liable to slight variations according to the position of the person. It is more frequent while standing than while sitting, and more frequent when sitting, than when in the recumbent posture.

Mental excitement has a marked influence on the pulse. Joy and sudden fits of anger, and sudden fright render the pulse full and frequent; grief and sorrow depress it.

A knowledge of the above facts is indispensable to the physician; he should be well acquainted with the normal pulse, and the various causes which exert their influence over it, for how is he,

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to know when the pulse is changed in its character from the normal standard, if he is not acquainted with the natural pulse, and the many and various causes, not morbid, which exert their influence over it?

The pulse is a source from which is often derived very great satisfaction by the skillful physician, both in a diagnostic and prognostic point of view. Some have asserted, that they are enabled in many cases to make out a correct diagnosis, alone by the character of the pulse, which assertion, however, I am much disposed to doubt; though the pulse is always to be looked to, in fact, in many cases it is the only guide the practitioner has,

The various causes which influence the pulse are no less varied than the characters,

Some have attempted to point out a particular pulse for each variety of

disease, which however are nothing more than combinations of the more distinct characters, which I shall attempt to describe,

The mode of examination is of no little importance to the physician as well as the patient. As it is a natural consequence for the patient to be somewhat agitated on the physicians entering the chamber, he should refrain from making an examination until the excitement of the moment has passed off and the patient becomes tranquil, unless the symptoms are of so urgent a character as to render a few moments of the greatest interest to the well fare of the patient. The examinations should be repeated at short intervals; The arm should be in a semiflexed position, so as to relax the muscles and allow the pulse full force.

The examination must not be conducted in too hasty a manner; The physician should apply two or three fingers

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to the artery and hold them there until, at least, thirty or forty pulsations are felt.

I shall now take up the pathological conditions of the pulse, as relates to the pulsations themselves or to the rhythm of the pulsation,

The most prominent and useful pathological conditions of the pulse, (and of which all the other characters are modifications) are the frequency, quickness, strength, fullness, hardness and irregularity. Writers have described many other characters of Pulse, as the intermittent, gaseous, shattered and obstructed; also a mortidly natural pulse.

I shall first consider it as relates to Frequency.

A frequent pulse is one in which the pulsations succeed each other with preternatural rapidity; this has reference to the time intervening between each pulsation, and when combined with fullness

and strength, it is indicative, always, of the greatest danger. It is far more dangerous than the same degree of frequency, with softness and moderate fullness. This state of things indicates great prostration of the vital energies.

It is impossible to say, exactly, when the pulse is frequent, though when it rises to or above a hundred and twenty beats in a minute, much danger is to be apprehended.

When the pulse becomes preternaturally slow, we may suspect compression of the cerebral substance, internal venous congestion, or general impairment of the vital energies, as in cerebral apoplexy or the malignant forms of fever.

Quickness, of the pulse, is frequently and very improperly confounded with frequency. Quickness has reference to the time occupied in each individual pulsation, whereas frequency

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refers to the intervals between each pulsation. Frequency and quickness are generally coexistent, though not necessarily. the pulse may be frequent without quickness.

What we mean by a strong pulse, is that which imparts to the finger, during the diastole of the heart, a sensation of preternatural resistance. This character of the pulse is very frequently confounded with the hard pulse by the inexperienced practitioner. These two characters of the pulse should not be confounded, one with the other, as it might lead to hurtful practice; A strong is always a favourable indication: but a hard pulse is indicative of a different state of things.

The pulse is called hard, when both in the systole and diastole of the heart, the artery is felt firm and unyielding under the finger like a tense cord. Hence the term Corded, has been applied to this variety of the pulse,

When the pulse is strong, it is never very frequent, a strong pulse seldom exceeds a hundred and eight beats in a minute.

The feeble pulse, is precisely the reverse of a strong pulse. It is denominated feeble, when the artery produces a very weak impulse against the finger in its diastole; as the frequent with the quick, and the strong with the hard pulse, so also is the feeble often confounded with the soft pulse. The difference, however, is quite apparent to the minute observer. The artery may pulsate very feebly and yet offer great resistance to pressure; and the pulse may be soft when the artery appears to be quite filled, yet it offers no resistance and may be easily vanished by the slightest pressure with the finger upon the artery.

A very soft pulse is seldom attended with great frequency or irregular-

ity; Occurring in the advanced stages of fever, it is a favorable symptom; but when joined with great difficulty of breathing and suffused countenance, in pneumonic inflammation it is a bad symptom - indicative of great danger.

A full pulse is never very frequent, though sometimes it is much slower than the normal standard.

The pulse is denominated small, when the diameter of the artery is smaller than natural, writers assert that this character of the pulse is attendant on inflammation seated below the diaphragm, and that the full pulse attends inflammation seated above the diaphragm, hence the terms inferior and superior.

When the pulse is small, feeble and occasionally quick, it is denominated the depressed pulse, this character of the pulse does not depend on actual debility or exhaustion; but

on internal venous congestion. If the congestion of the veins be partially relieved by venesection the pulse will immediately rise. A knowledge of this fact is often taken advantage of by practitioners for determining the true character of the pulse, or in other words, for distinguishing between the small and weak and the depressed pulse. Great caution is to be observed in the operation of blood letting lest the patient receive an injury from the abstraction of blood. It is sometimes very difficult to distinguish between this variety and the small and weak pulse: though the experienced physician is generally able to do this by attending to the prevailing diathesis, or "epidemic constitution" and by observing the period of the disease at which it occurs, or as before mentioned, by suffering a few ounces of blood to flow from the arm and watching its effects. If after the patient has lost a

few ounces of blood. The pulse should rise, or if it be small and obscure in the incipient stage of acute diseases, we may be well assured that the pulse is depressed.

The irregular pulse is characterized by a constant variation in the pulsations as respects frequency, quickness, size, hardness, fullness &c. When the pulse assumes this character, the greatest danger is to be apprehended.

The pulse often assumes an intermittent character, which of itself is a very bad symptom; This character of the pulse is sometimes habitual with persons in health, though as soon as disease is set up in the system it assumes a different character; It is said to be of dyspeptic origin; it is quite a common occurrence in subjects far advanced in life; This probably depends on diseases of the heart, as ossification of the valves &c.

If the patient have suffered from

previous attacks of rheumatism or gout. we have good ground to suspect ossification of the valves or some other affection of the heart; It also occurs in affections of the brain and in advanced stages of fever, where there is much prostration in cases of this kind, it is always a very bad symptom.

The gaseous pulse— the pulse some times assumes a character which is denominated gaseous, tumid, inflated or soap bubble pulse, The pulse never assumes this character unless the patient be in a state of extreme prostration.

It also assumes another highly dangerous character, generally denominated undulating. In this variety the pulse imparts to the finger a wave-like sensation; it is generally large, soft and feeble, though some times small. When small, it assumes another name viz;

The creeping pulse.

There is another character of the pulse which feels under the finger like a shattered or splintered quill. This variety is termed the shattered pulse. It most generally occurs in persons habituated to the use of intoxicating drinks or in persons who use large quantities of opium.

Occasionally we find that the artery remains equally filled during the diastole and systole of the heart when this is the case, we have what is termed the obstructed pulse.

Writers have spoken of another variety which occurs in malignant fevers (and which is a very unfavorable symptom) under the name of morbidly natural pulse. Were it not for the concomitant symptoms, this could not be distinguished from the normal, or healthy pulse.

Authors have described what are termed the compound pulses, as

the Synochus. The Synochal, Typhus, Typhoid &c, which are simply combinations and modifications of the frequent, quick, strong, hard, full and irregular pulses. Therefore they need not any further consideration

Besides the many and various characters of the pulse which I have mentioned, there are yet various others which have been described, which, however, as I conceive are of little or no practical value. Therefore I shall not speak of them,

Valentine A. Sublett,

Age 22 years.