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THE EXAMINATION OF ELDERLY MEN FOR FITNESS FOR AN ACTIVE PHYSICAL LIFE.

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Although the title of this article specifies that it is intended to apply to persons who have reached a certain age, the considerations set forth below apply equally to any individual whose work either in civil or military life involves active physical exertion.

The investigations and conclusions here discussed will be restricted to individuals who have exceeded the age of 50 and who exhibit symptoms or signs referable to the cardiovascular system.

The very difficult problem of fitness for active exercise presents itself to medical officers when an individual over the age of 50 exhibits abnormality of blood pressure, and it is the proper investigation of such cases and the correct conclusions to be arrived at that are here discussed.

The types of case are confined to the following, and in all cases the age is to be taken as 50 years or more.

1) Hyperpiesia, essential malignant hypertension.

2) Hyperpiesia, essential benign hypertension.

1) Hyperpiesia, Essential Malignant Hypertension.

These cases are fortunately few in number, but when an elderly subject presents a blood-pressure of over 180 mm. in systolic and over 100 mm. in diastolic pressure and at the same time exhibits any serious failure in the
concentrating power of the kidneys, as evidenced by a high-blood urea, with a poor urea concentration, or diminution of urea clearance, then a grave view must be taken. In such a case it is our duty as physicians to tell such an individual, that for his own prospects of life itself he must cease to engage in active physical pursuits. There is perhaps one exception which is justifiable, that in the event of a few months more service in employment which enables a pension to be obtained, which otherwise might not be obtained, he might be allowed to continue for that short period provided such service did not mean going abroad, and that the urinary and retinoscopic examinations did not indicate a rapidly progressing deterioration. From such simple cases which present no great difficulty we turn to the next group:

(2) Hyperpiesia, Essential Benign Hypertension.

It is an easily observable fact that in most of our great cities the life insurance offices are conspicuous for the grandeur and magnificence of their construction. There is little doubt that in the past far too grave a view has been taken of the mere occurrence of simple benign hypertension in the assessment of human expectation of life. Taken alone, simple hypertension does not unfit a man for active life, provided the abnormality is not excessive and always provided the kidney function is unimpaired.

In assessing the degrees of blood-pressure which must be considered to be serious, consideration of the condition of the arteries must be taken into account. Individuals differ greatly in this respect for one may give a blood-pressure reading of 200/110 without visible changes in the retinal vessels while another may show them with a reading of 170/90.

It may be stated as a general working rule that simple pressures exceeding 200/110 should without other evidences of pathological conditions be considered as unfitting any person for continued active physical pursuits. If evidence of arteriosclerosis is forthcoming then the limit allowable should be definitely under this figure, but individual cases can only be considered upon their merits when judged from all aspects. Quite apart from the question of fitness or unfitness on account of a high degree of hyperpiesia per se abnormal pressure readings may very definitely demand a full investigation into the cardiac and renal functions and perhaps it is on this account that the discovery of a moderately abnormal blood-pressure is of greatest moment.

Blood-pressures of course may be either too high or too low—the low ones may be in no way less important or less dangerous than the high. The individual who congratulates himself that though he may be a little out of breath on exertion, this does not matter, because his doctor tells him “he has the blood-pressure of a man of 20,” may well be exhibiting the clinical picture of a heart condition which will not sustain his life for very long—certainly his life will probably not be cut short by a cerebral
hæmorrhage but he may succumb to an equally fatal occlusion of vessels in the heart. In assessing the importance of abnormal pressures two factors become of outstanding importance: (1) The condition of the arteries; (2) the condition of the cardiac muscle.

In the writers' opinion the following sustained abnormal pressures in any man over the age of 50, call imperatively for a full investigation of the heart and vessels: (i) Over 170/90; (ii) under 130/60 if the resting pulse-rate exceeds 80 per minute.

The necessary procedures in such an examination are five in number: (1) Test for the Wassermann reaction of the blood; (2) an electrocardiogram; (3) an orthodiagram; (4) retinoscopy (arteriosclerosis); (5) tests of renal efficiency.

It is not proposed to discuss cases with chronic valvular lesions—it is sufficient to condemn without reservation any case with aortic insufficiency. Similarly a positive Wassermann reaction in a man with any cardiovascular abnormality should cause him to be found temporarily unfit.

We may now consider the case of the man with moderate hyperpiesia, say 170/90 without valvular disease and with some degree of arteriosclerosis. What indications of importance to his expectation of life or of continued health may be obtained from special investigations?

**Electrocardiograph Findings.**—There are two main questions to be answered: (X) Is there pathological interference with the conducting paths within the heart? (Y) Is there evidence of any interference with the nutrition of the muscle?

Under the first heading (X) evidence of the following is to be sought, and if found considered to be of serious import: (i) Heart block; (ii) branch bundle block; (iii) auricular flutter, or fibrillation, or paroxysmal tachycardia.

Under heading (Y) the following E.C.G. abnormalities must be considered of importance: (1) Inversion of T wave in Lead (i) or (ii); (2) inversion of P wave in Lead (i) or (ii); (3) abnormal excursion of Q wave in Lead (iii); (4) abnormal R-T. complex in Lead (ii) or (iii).

Some further discussion of these groups is necessary.

**Heart Block and Branch Bundle Block.**—These are definitely causes for abandoning active pursuits.

**Auricular Flutter or Fibrillation.**—Those cases which are associated with valvular disease (more commonly with the Rheumatic Group) present no difficulty, for the condition is the expression of advanced myocardial change, associated with a valvular lesion, and there is no doubt of their unfitness for continuance of service.

Fibrillation may be discovered at examination without the subject having been aware of its presence, and without any valvular disease or gross myocardial change. Its presence is a definite cause for marking the subject temporarily unfit with a view to further consideration and observation of the clinical picture. There are cases of fibrillation which
are of recent origin, and depend upon a toxic factor which may be capable of correction. In such cases if the normal rhythm be restored and remains restored for a period of two to three months there is no absolute ground for a verdict of permanent unfitness. Such a concession is the utmost that can be made, because in any subject in whom fibrillation has occurred, sudden and fatal cardiac failure must be considered as a future possibility. If such a subject is returned to duty there should be this provision, that he is seen by his medical officer frequently and that his case must be thoroughly revised at least once a year. There are instances in which a sudden fatal result has followed within a year or so of restoration of rhythm in these apparently toxic cases—similarly there are instances in which fibrillation has followed trauma and sepsis in comparatively young subjects, who have had their rhythm restored, and who have remained perfectly well for many years afterwards. Evidence of myocardial damage is the key to prognosis in these cases.

Paroxysmal Tachycardia.—This comparatively common condition is a difficult one to appreciate in terms of importance to the subject. Until recently most cardiologists have been inclined to a lenient view regarding paroxysmal tachycardia. It is true that we can name no cause for it, it is equally true that most of its subjects appear to go on for years without the development of myocardial degeneration in its usual manifestations—nevertheless in some, fatal seizure has occurred without other warnings.

Coronary Occlusion.

The conditions which may lead to it are discussed under the following headings:

(1) Incidence.—There is little doubt that the condition is encountered more often than formerly. Probably more cases are now diagnosed and recognized in the period prior to the occurrence of a second and fatal attack.

(2) Clinical Features.—As a result of much modern research, we now know certain facts about this accident; these may be summarized as follows:

(i) It occurs in all grades of severity from the immediately fatal major occlusion to the unrecognized minor one.

(ii) About one-half of the major cases die either in a few minutes, or as many hours. Of the immediate survivors again about one-half may die within six weeks. The remainder make a slow recovery and are usually severely incapacitated for the remainder of a life which may last some years, before a further occlusion abruptly terminates it.

(iii) Minor cases may pass unnoticed except for a subsequent decrease in cardiac reserve power.

(iv) In major cases there is usually a recognizable change in the RT complex.
The E.C.G. diagnosis rests upon a "changing abnormality" in this complex occurring during the weeks following the attack. In minor cases these changes may not occur.

(v) The accident is conditioned by changes of obliterator type in the coronary vessels or their origin from the aorta. It is thus an end result either of syphilitic aortitis or of arteriosclerosis.

(3) Prognosis.—Is it possible to foretell the probable occurrence of this accident? In the great majority of cases the answer is "No."

We have no means of directly measuring the state of health of the coronary vessels—we can only record the effects of such changes as they may appear in the heart's action and size, response to effort, or in the picture written upon the electrocardiograph tracing.

There is one symptom, however, of considerable help in appraising the probable condition of the coronary vessels, and when it occurs it is of outstanding importance—it is the symptom of pain on effort, known as true or effort angina. True angina is a symptom of localized anaemia of some portion of the heart muscle—it may precede the accident of thrombosis or it may develop as a direct consequence of a non-fatal thrombosis. In either case the syndrome is incontrovertible evidence of unfitness for an active physical life. While it is as yet impossible to forecast the probable occurrence of coronary occlusion in any particular case, unless one attack has already been survived, it is still possible to mark out a zone within which subjects may be said to be liable to this very terrible accident—the liability is a general one and cannot be expressed in any terms of probability. We may consider this zone to embrace the following clinical conditions:

(i) Hyperpiesis with arteriosclerosis.
(ii) Anginal pain on effort.
(iii) Electrocardiographic evidence of myocardial degeneration of any serious type.
(iv) Hypopiesis accompanied by poor exercise tolerance and a high pulse rate while at rest.

We may now summarize the foregoing clinical findings and state the interpretations to be applied in degree of importance to the individual:

A. Immediate cessation of active physical exertion for purpose of prolonging life.
   (i) Hyperpiesia with advancing renal sclerosis.
   (ii) True angina.
   (iii) Heart block and branch bundle block.

B. Drastic reduction of active physical exercise.
   (i) Moderate hyperpiesia with definite arteriosclerosis.
   (ii) Myocardial conditions indicated by persisting fibrillation or flutter and by the electrocardiograph findings set out on p. 363 under heading (Y), or poor exercise tolerance.
   (iii) Simple hyperpiesia with pressures over 200/110.
C. Temporary cessation of active physical exercise for full investigation to be carried out.

(i) Auricular fibrillation of recent origin.
(ii) Paroxysmal tachycardia.
(iii) Aortitis with positive Wassermann reaction in the blood.
(iv) Pressures exceeding 170/90.
(v) Pressures under 130/60 with rapid pulse.

The writers would draw attention to the fact that the preliminary investigation of pressure and urinary condition is a simple one, but that in its proper performance and in the interpretation of its results many problems may arise which can only be conscientiously solved by a close study of the indications which such a simple examination properly carried out is capable of disclosing.

For example, an individual may show:


Further investigation might well show:

Arteriosclerosis in retinal vessels. Blood urea 60 milligrammes per 100 cubic centimetres. Concentration (C) 1'8 per cent. Inverted T in Leads (i) and (ii). Verdict: decidedly unfit.

No mention has been made of orthodiagraph findings as it has not been considered advisable.