we deal with it with periodical testing, I do not yet know.

Prof. Wilcken: There is a difference between convenience and the truth and it is certainly understandable that for epidemiological studies one would want to use phase V. I really should know the answer to the question that I am asking, but I do not: If you measure the blood pressure directly and relate it to phase IV and phase V, to which does it relate best?

Dr Labarthe: I would guess there are others here who are better qualified than I to respond. My impression, based on the few papers that deal directly with this problem and on the summary in Geddes' book (The Direct and Indirect Measurement of Blood Pressure, Year Book Medical Publishers, Chicago 1970), is that the intra-arterial reading in diastolic pressure is likely to fall somewhere between the 4th and 5th phase; there may be wide individual differences in this.

Prof. Lovell: I am delighted to hear you put it that way. Our own version would be that there are an equal number of apparently very well made observations showing the best concordances with one as there are with the other.

Dr R. Graham (Sydney): Could Dr Labarthe offer some explanation as to the mechanism of erroneous readings with smaller cuff sizes and suggest the best and optimal cuff size, considering the difference in length between patients.

Dr Labarthe: Ordinarily it is arm circumference which is of concern and I think the important matter is that the circumference of the arm be properly taken into account when the cuff is applied. In our own programme, we have a set of successive sizes of cuffs; the currently manufactured cuffs from the Baum Company are marked on the inner surface so that the observer can determine quite readily whether the cuff of appropriate size is being used. Regarding cuff width and length of arm, I think this does not become a serious problem until one is dealing perhaps with paediatric populations.

Pre-Treatment Workup for Antihypertensive Treatment

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Summary

The prevalence of primary and secondary hypertension and of heart and kidney involvement was thoroughly studied in 689 hypertensive subjects derived from a blood pressure screening examination of a total population sample of Swedish men (n=7,452).

The prevalence of secondary hypertension was found to be only 5%, the prevalence of surgically curable hypertension being even lower. Left ventricular hypertrophy and slight heart enlargement were each found in about one-third of the hypertensive patients, while severe heart enlargement, left ventricular hypertrophy on ECG, proteinuria, abnormal serum creatinine and urinary sediment were each found in about 5%.

On the basis of these findings, a minimum pre-treatment workup in uncomplicated hypertension is proposed.
1. Introduction

The extent of diagnostic workup needed varies with the type of hypertensive population that the physician encounters. A much more extensive workup is needed in highly selected hypertensives at a hospital clinic than in unselected hypertensives derived from screening examinations in total populations. The frequency of secondary hypertension and of organ involvement is higher in the hospital clinics due to a selection towards more severely hypertensive subjects. Therefore, it must be stressed that this paper only deals with the minimum investigations needed in unselected hypertensives derived from screening procedures. It does not deal with the question of what diagnostic tests have to be done in patients referred to hospital outpatient clinics or to specialised hypertension clinics.

Furthermore, the extent of a diagnostic workup for any disease is, of course, dependent upon the medical facilities available in that community. This paper deals with the diagnostic workup in communities with well-developed medical care systems. In under-developed countries with fewer medical facilities the extent of the diagnostic work-up, if done at all, would be severely restricted.

Why do a pre-treatment workup at all? Why do we not diagnose the hypertension by repeated blood pressure measurement and then start treatment? The first objective for a diagnostic workup is to find the rare cases of surgically curable hypertension like renal artery stenosis, primary aldosteronism and phaeochromocytoma. The second objective is to find the prognostically bad cases, i.e. those who have developed detectable organ manifestations in the heart, kidney or arterial tree.

The third objective is to obtain a baseline to enable comparisons to be made in the future, when changes take place in the heart and kidney function. A diagnostic workup may also be helpful in substantiating the diagnosis of hypertension, for example through the detection of left ventricular hypertrophy in a subject with only mild blood pressure elevation. Such a finding strengthens the indication for therapy.

2. The Prevalence of Secondary Hypertension

The first objective mentioned was to find secondary, curable forms of hypertension. The prevalence of secondary hypertension will thus be one of the factors determining the extent of the pre-treatment diagnostic workup. The prevalence has been very variably estimated by different workers, but in general it has varied between 10 and 25% of the hypertensive population (Pickering, 1968). It must be remembered, however, that these estimates have been made from hospital series.

There are few data on the prevalence of secondary hypertension in unselected hypertensive populations derived from blood pressure screening examination. This is probably explained by two facts. Firstly, a diagnostic workup has to be fairly extensive to be able to rule out secondary forms of hypertension with reasonable certainty. Secondly, as secondary forms of hypertension are rather rare, a large number of hypertensives must be homogeneously investigated to allow a proper estimate of the frequency of various forms of secondary hypertension.

At the Hypertension Clinic in Göteborg we have had a unique opportunity to study a large population of hypertensive patients derived from a blood pressure screening examination of 7,452 men aged 47 to 54 years (Wilhelmsen et al., 1972). Hypertension was defined as casual blood pressures above 175 mm Hg systolic and/or 115 mm Hg diastolic on two separate occasions two weeks apart, or current antihypertensive treatment. With this definition, 689 men (9.2%) were found to have hypertension and referred to the Hypertension Clinic for a pre-treatment workup. The diagnostic workup at the Hypertension Clinic has previously been described (Wilhelmsen et al., 1973). The methods used for exclusion of secondary forms of hypertension are presented in table I.