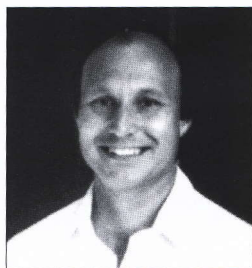


# Can people tell if their blood pressure is up?



## Curriculum Vitae

Prof Ron Henbest was born in Edmonton, Alberta (Canada) where he qualified in 1974 with a BSc in Maths and Psychology and in 1978 with an MD from the University of Alberta. He then completed two years postgraduate study (residency) in Family Medicine with the Department of Family Medicine at the University of Western Ontario (Canada) and obtained his CCFP from the College of Family Physicians of Canada. He joined the Department of Family Medicine at Medunsa in 1980. He has a particular interest in the doctor-patient interaction and its importance for healing. He returned to the University of Western Ontario in 1984 to take their Master of Clinical Science Degree in Family Medicine (MCISc), which emphasises patient care, teaching and learning, and research. His thesis on Patient-Centred Care involved the development of a method for measuring patient-centredness and testing it against patient outcomes. In 1989, Ron returned to his home city, Edmonton, for a period of 21 months where he was engaged as an associate professor in the Department of Family Medicine at the University of Alberta. During this time he also completed further training in systemic family therapy. In October 1990, Ron returned, with his wife Judy and four year old son Benji, this time as associate professor and deputy head of the Department of Family Medicine at Medunsa.

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## Summary

*Traditional medical teaching is that hypertension is asymptomatic. But many patients think they can tell if their blood pressure is up and many practitioners take patients' blood pressures in response to symptoms. During the past few decades, increasing attention has been paid to the importance of the subjective, including patients' thoughts, feelings and expectations about their illnesses. The purposes of this study were:*

- 1. to test the hypothesis that patients can tell whether their blood pressure is normal or high;*
- 2. to test the hypothesis that high blood pressure is symptomatic; and*
- 3. to determine patients' understanding of high blood pressure.*

*The study was conducted in Ga-Rankuwa, South Africa, a large black township, northwest of Pretoria. Two main samples participated: people attending the major shopping complex in Ga-Rankuwa and patients attending for health care at Ga-Rankuwa Hospital and Ga-Rankuwa Clinic. Both quantitative (cross-sectional) and qualitative methods were used. Participants first took part in an interview involving both structured and free attitude components, and then had their blood pressures measured independently.*

*A total of 1 004 people participated (a response rate of 97%) ranging from 16 to 88 years in age. The blood pressures ranged from 84 to 258mmHg systolic and from 50 to 178mmHg diastolic, with 29% of the participants having elevated blood pressures at the time of the study.*

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## KEYWORDS

Physicians, family;  
Blood pressure;  
Patient participation;  
Knowledge, attitudes,  
practice;  
Research.



# Can people tell if their BP is up?

*The three main findings of the study were as follows. Firstly, 78% of the participants thought they could tell whether their blood pressure was high or normal and 70% were right. The odds of a person having high blood pressure if they thought it was high was 3,5 times ( $p=0$ ) the odds of having high blood pressure if they thought it was normal. This association remained even after controlling for confounding factors. Secondly, high blood pressure was associated with symptoms. The odds of a person with high blood pressure having symptoms was 2,74 times ( $p=0$ ) the odds of having symptoms if the blood pressure was normal. Thirdly, a major theme regarding patients' understanding of high blood pressure was expressed in terms of 'body heat'. The first two findings are presented in the present paper, the third in a subsequent paper.*

*The results of this study question the long held belief that hypertension is asymptomatic. Patients may well be much more aware of their blood pressures than has previously been recognised. Further study is indicated.*

## Introduction

Traditional medical teaching continues to be that high blood pressure is asymptomatic<sup>1,2</sup> in spite of the fact that many people experience symptoms that they think are due to elevated blood pressure. One of the key principles of family medicine is to pay attention to the thoughts and feelings of patients in recognition of the importance of the subjective aspects of medicine.<sup>3-5</sup> Indeed, many if not most, doctors respond to some symptoms presented by patients by taking the blood pressure, as if elevated blood pressure could cause those symptoms. A common example of this is headache, where perhaps most doctors check the patient's blood pressure, and some even treat it. If people do experience symptoms due to elevated

blood pressure, and are thus able to tell if their blood pressure is up, then this is important information for patients and doctors alike.

A second point related to the importance of the subjective concerns a people's understanding of high blood pressure. Many studies have shown that clear communication about the nature of the problem and a practical understanding of it, especially in relation to implications for management, is associated with patient satisfaction and compliance.<sup>6-11</sup>

In recognition of the importance of the subjective, this study sought to answer the following three questions:

1. Can people tell if their blood pressure is up?
2. Is high blood pressure asymptomatic?
3. How do people understand high blood pressure?

This paper presented the results of the portion of the study conducted to answer the first two questions; a second paper will describe the results that concern the third question.

## METHOD

### Setting:

The study took place in Ga-Rankuwa Township, 32 kilometres northwest of Pretoria. Samples were drawn from two main settings. The first was "community-based" to make it possible for most members of the community to participate. The site chosen was the main shopping centre complex in Ga-Rankuwa, known locally as 'Ga-Rankuwa City'. The second was a health facility and thus, mainly patient and health care provider-based. The health facilities utilised were the three government clinics in Ga-Rankuwa, and Ga-Rankuwa Hospital, including the family practice teams, and the hypertension clinic conducted by the Department of Internal Medicine.

Is high blood pressure really asymptomatic?

If people do experience symptoms due to elevated BP, it is very important for doctor and patient alike.



# Can people tell if their BP is up?

## Sample:

The study involved people from all 11 national language groups. All people aged 16 years and older were eligible to participate. The sample size required to give an accurate estimate (within 5%) of the percentage of persons who could tell if their blood pressure was up (with 95% confidence) was 291 with elevated blood pressure and 700 with normal blood pressure for a total of approximately 1 000 persons. At the shopping centre, signs were put up offering a free blood pressure check to all willing to take part in the study. At the health facilities, all eligible patients and staff were asked to participate.

## Study design:

This study involved the collection of both quantitative and qualitative data. The design for the quantitative data collection was cross-sectional. Participants were interviewed concerning blood pressure and immediately thereafter had their blood pressures measured independently.

## Variables:

The four key variables in this study were:

1. what participants said about their blood pressure levels;
2. the presence of symptoms;
3. participants' blood pressures; and
4. participants' understanding of high blood pressure.

The first, second and fourth were determined by a semi-structured interview, using both closed and open-ended questions in the participant's language of choice. This interview was field tested to be sure that the questions were easily and correctly understood. Three trained interviewers conducted the interviews.

Participants' blood pressures were measured independently by a single,

experienced family physician (RH), who was completely unaware of the patients' responses to the interview. The blood pressure was taken three times in the right arm seated, using a calibrated mercury baumanometer. The 1st and 5th Korotkoff sounds were used for systolic and diastolic pressures respectively. The World Health Organisation/International Society of Hypertension (WHO/ISH) guidelines were used for classification of hypertension.

Observer bias was reduced in the following ways: firstly, the participants were interviewed before their blood pressures were taken; secondly, the interviewers were completely unaware of the participants' blood pressures; and thirdly, the doctor measuring the blood pressures was unaware of the participants' responses to the interview.

The study was controlled for the following potentially confounding factors: age, sex, level of education, marital status, health-related education, whether participants had previously been told their blood pressures, or were on treatment.

## RESULTS

### Demographic data and participant characteristics

Of the 1 035 people asked to take part in the study, 27 persons at the shopping centre refused, three patients at the hospital refused, no patients at the clinics refused and one data form was incomplete such that 1 004 persons had a complete data set (97%).

As shown in Table 1, the participants ranged widely in age, 62% were female, 47% were married, a range of educational levels was represented, most had no health education, two-thirds were Tswana, a significant percentage had never had their blood pressure taken before (17% of all participants, 30% of those seen at the

Many doctors do take a BP in response to complaints or symptoms.

If participants thought their BP was high, they were right 51% of the time.



# Can people tell if their BP is up?

**Table 1: Participant characteristics, Ga-Rankuwa adults, 1995**

<b>Age:</b>	Range 16-88 years. Mean 40 years. SD 16 years.	
<b>Sex:</b>	Female	62%
<b>Marital status:</b>	Married	47%
	Separated/widowed/divorced	16%
	Never married	37%
<b>Education:</b>	Did not complete primary	19%
	Completed primary	47%
	Completed secondary	23%
	Completed higher education	11%
<b>Health education:</b>	None	73%
<b>Language group:</b>	Tswana	68%
	Northern Sotho	13%
	Zulu	6%
<b>Site:</b>	Shopping complex	57%
	Health facilities	43%
<b>Blood pressure taken before:</b>	Never taken	17%
	Taken within one year	68%
	Taken within five years	80%
<b>Told BP before:</b>	Never told	44%
	Told normal	16%
	Told low	2%
	Told high	38%
<b>BP explained before:</b>	No	75%
<b>On treatment:</b>	Never	65%
	Previously	10%
	At present	25%
<b>Symptoms present at interview:</b>	Yes	27%
<b>Regular source of care:</b>	Yes	56%

shopping centre), only a slight majority had previously been told how their blood pressure was, most had not had high blood pressure explained, the majority were not on treatment and about one-quarter had symptoms present at the time of the study. Of note, slightly more than half reported having a regular source of care.

The participants had a tremendous range in both systolic and diastolic pressures as shown in Table 2 with 29% of the participants having elevated blood pressure at the time of the study.

## Do people think they can tell if their blood pressure is up?

As shown in Table 3, 64% of participants responded yes, when asked in general, if they could tell if their blood pressure was up. The 10 most common symptoms mentioned are shown on the table with headache being the single most common symptom, followed closely by sweating and feeling hot. When asked what they thought their blood pressure was "right now", at the time of the interview, 78% gave an opinion, with the majority thinking that it was normal.

Table 4 shows that being female, older, less educated, told previously your blood pressure is high, being on treatment and having symptoms were all associated with participants thinking that they could tell how their blood pressure was. All of these factors, except being less educated, were also associated with participants thinking their blood pressure was high.

For example, 33%, 19% and 16% of those who had previously been told

64% answered yes, they could tell if their BP was up.

Headache the single most common symptom followed by sweating and feeling hot.

**Table 2: Blood pressures, Ga-Rankuwa adults, 1995**

<b>Systolic:</b>	Range 84 to 258	Mean 135	SD 24
<b>Diastolic:</b>	Range 50 to 178	Mean 87	SD 14
<b>World Health Organisation/International Society of Hypertension Classification</b>			<b>%</b>
Normal.....			71
Mild borderline.....			9
Mild.....			9
Moderate and severe.....			7
Isolated systolic.....			4
<b>Total.....</b>			<b>100</b>



# Can people tell if their BP is up?

their blood pressure was high, normal and never been told, respectively, thought their blood pressure was high (p 0.0000001). Similarly 37%, 28% and 16% of those on treatment presently, previously, and never, thought their blood pressure was high (p 0.0000001). Of note, 80% of those with symptoms present at the time of the study thought their blood pressure was high in marked contrast to the 3% of participants without symptoms who thought their blood pressure was high.

## Can people tell if their blood pressure is up? Are they right?

Table 5 shows that if participants said their blood pressures were normal, they were right 77% of the time; if they said their blood pressures were high, they were right 51% of the time. In all, 546 or 70% of the 784 patients who thought they could tell how their blood pressure was, were right.

Table 6 shows that if participants said

that their blood pressures were high, then they were significantly more likely (odds ratio of 3,47) to have high blood pressures than if they said their blood pressures were normal. Table 7 shows that participants with a mild borderline elevation of blood pressure were even more likely than participants with a higher blood pressure to say their blood pressures were high.

This result held after controlling for all of the potentially confounding factors. One example is given in Table 8, a "three-dimensional" table that shows the relationship between what participants said their blood pressures were and what

their blood pressures actually were, controlled for treatment. The numbers in the table are the percentages of patients who said their blood pressures were high; the numbers in brackets are group sizes. For example, reading the figures for "Never" on treatment column, 42% of the 59 participants who had never been on treatment and who had high blood pressure, said that their blood pressures were high in contrast to the 19% who said their blood pressures were high of the 370 participants who had never been on treatment and who had normal blood pressures. A significantly greater percentage of

**Table 3: Percentage of participants who think they can tell if their blood pressure is up**

<b>A In general</b>	
Yes .....	64%
Don't know .....	20%
No .....	16%
<b>Total.....</b>	<b>100%</b>
<b>B How: Top 10 symptoms (n=642, the 64% who said yes)</b>	
1....Headache .....	63%
2....Sweating.....	51%
3....Feel hot.....	50%
4....Dizzy.....	49%
5....Tired.....	43%
6....Emotions.....	37%
7....Malaise .....	33%
8....Palpitations .....	22%
9....Abdominal pain.....	21%
10....Swelling .....	14%
<b>C Opinion about their blood pressure at the time of the study:</b>	
Very high.....	2%
High.....	20%
Normal.....	54%
Low.....	2%
Don't know.....	22%
<b>Total.....</b>	<b>100%</b>

**Table 4: Factors associated with people thinking they can tell if their blood pressure is up**

Factor		Percent who thought they could tell
Sex:	Female	71
	Male	53
Age (years):	16-25	46
	26-40	59
	41-50	70
	51-60	77
	61 or older	83
Education:	Less than primary	81
	Primary	66
	Secondary or higher	51
Told BP previously:	Never	52
	Normal	50
	High	84
On treatment:	Never	53
	Previously	80
	Presently	90
Symptoms present:	Yes	90
	No	61

**p = 0,000001 for all of the above factors**

**If participants said their BP was normal, they were right 77% of the time.**



# Can people tell if their BP is up?

**Table 5: Percentage of participants who could tell if their blood pressure was up**

Participant said blood pressure	No. of participants*	Percent of participants who were right
Normal	566	77%
High	218	51%

\*784 participants offered an opinion about their blood pressure

participants with high blood pressure said that their blood pressures were high, than those with normal blood pressures, and this relationship was present for all three treatment groups.

## Is high blood pressure asymptomatic?

Table 9 shows that participants with high blood pressures were significantly more likely (odds ratio 2,74) to have symptoms than participants with normal blood pressures. This relationship remained after controlling for all of the potentially confounding factors and after controlling for severity of blood pressure elevation. The percentage of participants having symptoms was the same (41%) for both the mild and moderate/severe categories of high blood pressure and slightly higher (46%) for those with isolated systolic elevation of blood pressure.

## DISCUSSION

The results of this study may surprise some, but others will find that they support convictions long held.

In spite of the prevailing thinking that hypertension is asymptomatic, with the consequent message to both doctors and patients that patients cannot tell how their blood pressure is and in spite of inadequate or even inaccurate information being given to patients when their blood pressures are taken, 78% of the participants in this study thought that

they could tell how their blood pressures were and 70% of them were right.

The finding that participants with more education were less likely to think they could tell how their blood pressures were, would support the notion that what is happening within our bodies gets "educated out of us" the more education we have. We cease to trust our bodies and become reliant on technology to tell us how we are.

Another finding of interest was that participants with a mild borderline

78% of participants thought they could tell how their BP was and 70% of them were right.

**Table 6: The relationship between what participants said about their blood pressures and their blood pressures**

Participant said blood pressure	No. of participants*	Percent with high blood	Odds ratio
High	218	51	3,47
Normal	566	23	1,00

$X^2 = 56,48$ .  $P=0,0000000$

\* 784 participants offered an opinion about their blood pressure

elevation of blood pressure (systolic pressure: 140-160; diastolic pressure: 90-95) were more likely to be aware that their blood pressures were up than participants with higher levels of blood pressure. One hypothesis would be that participants with milder elevations of blood pressure are still sensitive to such elevations; that is, they have not yet become used to an elevated blood pressure and that the duration of the ele-

The more education the less we trust our bodies to tell us how we are.

**Table 7: Percentage of participants who said their blood pressure was high according to level of blood pressure**

Level of blood pressure	No. of participants*	Percent of participants who said blood pressure was high
Mild borderline	74	60
Mild	79	34
Moderate/severe	62	39
Isolated systolic	29	59

$X^2 = 13,04$   $df = 3$   $P = 0,004$

\*There were 244 participants with elevated blood pressure who thought they could tell how their blood pressures were



# Can people tell if their BP is up?

**Table 8: Percentage of participants who said their blood pressure was high by blood pressure and treatment**

Blood pressure	Overall	Treatment		
		Never	Previously	Presently
High	46 (244)	42 (59)	51 (37)	50 (128)
Normal	20 (540)	19 (370)	15 (47)	29 (80)
Odds ratio	3,21	6,03	2,52	3,47
P	0,00008	0,0008	0,003	0,0000000
<b>X<sup>2</sup> for interaction = 2,08,</b>		<b>P = 0,35</b>		

vated blood pressure is likely to be important.

## CONCLUSION

The results of this study support the belief in the significance of the subjective by providing evidence that people may be much more aware of their blood pressures than has previously been realised. This study thus challenges the long held belief that hypertension is asymptomatic. Participants with elevated pressure were significantly more likely to identify their blood pressures as elevated than those with normal blood pressures. Further, participants with elevated blood pressures were significantly more likely to have symptoms. Further research is warranted amongst other populations to see if our findings can be confirmed.

## Acknowledgements

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**Table 9: The relationship between blood pressure and symptoms**

Blood pressure	No. of participants*	Percent of participants with symptoms	Odds ratio
High	280	41	2,74
Normal	634	20	1,00

**X<sup>2</sup> = 42,17. P=0,00000000**

**\* 7 914 participants had data regarding presence of symptoms at time of study**