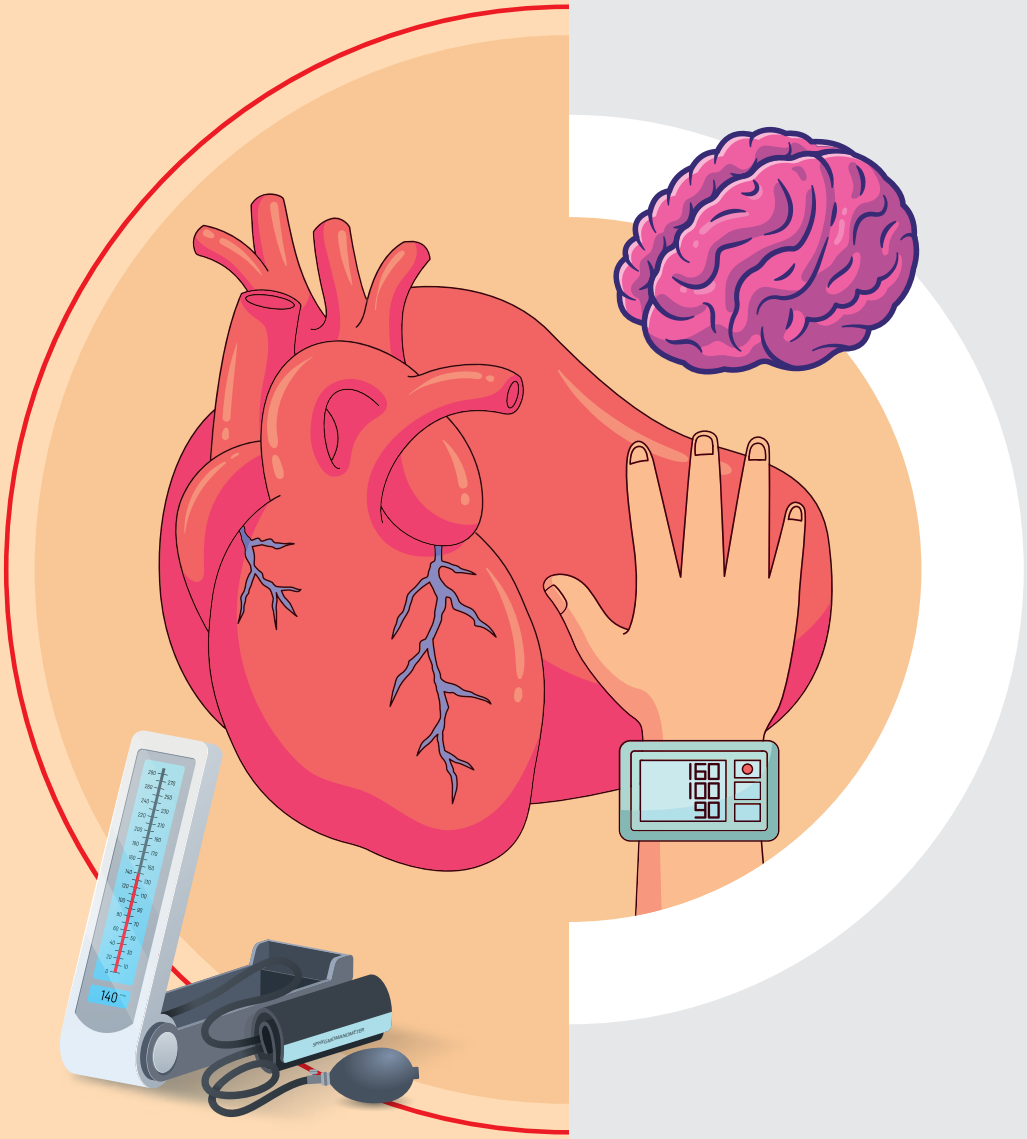
Bureau of Police Research and Development

Ministry of Home Affairs, New Delhi



PROCEEDINGS OF THE WEBINAR ON

Hypertension & Stroke

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Hypertension & Stroke

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पुलिस अनुसंधान एवम् विकास ब्यूरो
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Bureau of Police Research & Development
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New Delhi-110037

MESSAGE

e rising prevalence of hypertension in Police Forces is a matter of concern. Available evidence suggests that prevalence of hypertension could be as high as 30-35% in police forces. Stroke could be a serious consequence of uncontrolled hypertension.

Obesity, unhealthy diet, and faulty lifestyle are some of the contributing factors for rise in cases of hypertension in our population, including the police forces. Besides, the police forces are exposed to a highly stressful work environment, which might further worsen their health conditions. Lifestyle factors, such as sedentary nature of the job, long hours at work, unable to ful l social commitments and inadequate sleeping hours, among others, may also be responsible.

With a view to increasing awareness about Prevention, Management, and Control of Hypertension & Stroke in the Police Forces of the country, the Modernization Division of the BPR&D conducted a webinar on **'Hypertension & Stroke: Prevention, Management, and Control'** at the BPR&D Headquarters, New Delhi, on March 25, 2021. ree eminent experts of the country delivered talks on important aspects of "Hypertension & Stroke" and shared their experiences. ey also clari ed many of the issues raised by the participants.

I congratulate Dr. Karuna Sagar, IPS, IG/Director, Modernization Division, and his team of dedicated o cials, comprising Shri B. Shanker Jaiswal, IPS, DIG/Deputy Director, and Dr. Ajit Mukherjee, PSO (LS), on successful conduct of this important webinar.

I believe, the proceedings of the webinar will be very useful for our Police Forces and will go a long way in preventing and controlling Hypertension and Stroke and ensure overall health and well-being of police personnel.

27/7/21

(V.S.K. Kaumudi)

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महानिरिक्षक / निदेशक (आधुनिकीकरण)

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National Highway-8, Mahipalpur,
New Delhi-110037

EXECUTIVE SUMMARY

Hypertension is one of the major lifestyle diseases affecting our population and Police Forces alike across the country. To increase awareness about Hypertension among Police Forces of the country, the Modernization Division of BPR&D organized a Webinar on **"Hypertension & Stroke: Prevention, Management, and Control"** on March 25, 2021 from 11 AM - 1.30 PM at the BPR&D Headquarters, New Delhi.

Three eminent speakers of the country namely, Prof. Debashish Chowdhuri, Director Professor, G B Pant Institute of Post Graduate Medical Education and Research, New Delhi, Prof. Kameshwar Prasad, Padma Shri, Director, RIMS, Ranchi, Jharkhand, and Prof. M V Padma Srivastava, Padma Shri, Head, Deptt. of Neurology, AIIMS, New Delhi delivered talks on various important aspects of Hypertension & Stroke and clarified many issues raised by the participants. One hundred and fifty eight Police Officials from CAPFs, States/UTs, CPOs and outlying units of BPR&D participated in the webinar from all over the country.

Shri Santosh Mehra, ADG welcomed all the speakers and participants and delivered the inaugural address. He felt that Hypertension & Stroke was a huge health problem for the police forces and expressed his happiness that the Modernization Division of BPR&D is conducting a webinar on a topic of great importance. He also expressed his concern on the rising prevalence of Hypertension in the country and especially in the Police Forces.

Speaking first, Prof. Debashish Chowdhuri said, Hypertension is a silent killer and is also a major reason of death due to Stroke. He mentioned that hypertension affects many organs of our body and causes bone loss, kidney diseases, loss of vision, stroke, depression and anxiety, heart diseases, and sexual problems. He mentioned increasing age, high BMI, high waist circumference and waist-hip ratio, extra salt intake, alcohol, smoking, and diabetes among the risk factors for hypertension. Following his talk, Prof. Chowdhuri clarified many of the issues raised by the participants.

Prof. Kameshwar Prasad, the second speaker of the webinar talked about the important issue of "Management of High BP and Stroke". He explained the major blood vessels of the brain. He clarified the difference between **Ischemic s troke** and **Brain Haemorrhage** and laid a lot of emphasis on early recognition of critical symptoms so that the patient could be admitted to the hospital and given the treatment without wasting time. At the end of his talk, Prof. Prasad clarified many important points raised by the audience.

Prof. M V Padma Srivastava, the third and last speaker of the webinar talked about "Life Style and Diet for Stroke Prevention". She classi ed the risk factors of the stroke into two categories viz., **Modifiable** and **Non-Modifiable**. She laid lot of emphasis on lifestyle factors and explained the type of diet to be consumed in order to prevent occurrence of stroke. She also speci ed a number of important take home messages and answered many queries raised by the audience.

Overall, it was an excellent webinar covering all the important aspects on Prevention, Management, and Control of Hypertension and Stroke Hope, the proceedings of the webinar will cater to the health-needs of our Police Forces and help in preventing Hypertension & Stroke.

(Dr. Karuna Sagar, IPS)
IG/Director, (Modernization)

HYPERTENSION & STROKE: PREVENTION, MANAGEMENT, AND CONTROL

BPR&D Headquarters, NH-8, Mahipalpur, New Delhi
March 25, 2021

To increase awareness about Hypertension and Stroke among the Police Forces of the country, the Modernization Division of the Bureau of Police Research and Development (BPR&D) organized a webinar on "Hypertension and Stroke: Prevention, Management, and Control" on March 25, 2021, at BPR&D Headquarters, New Delhi from 11 am – 1.30 pm. One hundred and y-eight Police O cials from CAPFs, States/UTs, CPOs, and outlying units of BPR&D participated in the webinar.

Shri Santosh Mehra, ADG, Shri Karuna Sagar, IG/Director, Modernization, Shri B Shanker Jaiswal, DIG, Modernization were among the distinguished participants from BPR&D. Prof. Debashish Chowdhury, Director Professor, G B Pant IPGMER, New Delhi, Prof. Kameshwar Prasad, Director, RIMS, Ranchi and Prof. M V Padma Srivastava, Department of Neurology, AIIMS, New Delhi were the three eminent speakers who talked on various important aspects of Hypertension and Stroke.

Shri Santosh Mehra welcomed all the speakers and participants and delivered the inaugural address. He felt that Hypertension and Stroke was a huge health problem for the police forces. In the recent pandemic on COVID, the stress levels of police forces ran high for various reasons. Proper imposition of lockdown, ensuring availability of essential food items without anyone facing hardships, thousands of people going back home without any transport facility, and providing protection against the infection were among the factors responsible for causing stress. He also felt that the present webinar is a timely initiative and that the experienced and eminent speakers of the country will elaborate upon various issues linked with Hypertension and Stroke. He hoped that the deliberations during the webinar will largely bene t the police forces of the country.

Current status of Hypertension & Stroke in the country and evaluation of risk factors with particular reference to lifestyle

Dr. Debashish Chowdhury, the rst speaker of the day began his talk by saying that Hypertension is a silent killer and is associated with doubling the risk of death due to Stroke, Heart Disease, Peripheral Vascular Disease, and Kidney Disease. Globally, Hypertension causes 9.4 million deaths every year. Lowering High BP can prevent death and disability. He explained the phenomenon of Blood Pressure (BP) in the human body. He further explained the various classi cations of BP such as Normal (<120/80), Pre-hypertension (120-129/<80), Stage 1- hypertension (130-139/80-89), and Stage 2- hypertension (≥140/90). By and large, one should target a BP of ≤130/80 although a BP of 120/80 should ideally be attained. Talking about the epidemiology of hypertension, he discussed both global and Indian scenarios. Quoting results from Meta-analysis, he observed that the prevalence of hypertension in urban and rural/slum areas of the country was respectively 32 and 28 %. e NFHS 4 (National Family

Health Survey round 4) data covering a population of 15-49 years revealed an overall prevalence of hypertension as 11 % with 14 % in males and 10 % in females. Whereas, the DLHS (District Linked Household Survey 4) and Annual Health Survey of GOI showed a prevalence of hypertension as 25% in males and about 20 % in females. He also showed an increasing trend of hypertension in the country over the years. Quoting two studies done on police forces in West Bengal and Haryana, he noticed the high prevalence of hypertension across all age groups in police personnel.

Dr. Chowdhury mentioned that hypertension a ects many organs of our body and causes bone loss, kidney diseases, loss of vision, stroke, depression and anxiety, heart diseases, and sexual problems. Talking about risk factors he said many studies done in the past had reported increasing age, high BMI, high waist circumference and waist-hip ratio, extra salt intake, alcohol, smoking, and diabetes among the risk factors for hypertension. He noted that 14% of all-cause deaths were associated with hypertension with systolic BP being ≥140 mmHg. He also showed increasing trends in deaths and disability-adjusted life years (DALY) due to high BP as reported in a report on Global Burden of Diseases, 2016.

Dr. Chowdhury classi ed Clinical Stroke into two categories namely, Ischemic and Hemorrhagic. e Ischemic category was further divided into Arterial and Venous. Similarly, the Hemorrhagic category was also divided into Primary and Secondary. Discussing global, regional, and national burden of stroke from 1990-2016 as reported in the Global Burden of Disease, 2016, he pointed out that India is shown with an incidence rate of stroke of 121-150 per 100,000 people. Explaining another graphic, Dr. Chowdhury showed a rising incidence of stroke in the country with increasing age both for males and females. Quoting from the results of a systematic review in 2017, he observed that incidence of stroke ranged from 105-152 per 100,000 persons per year and that the crude prevalence of stroke ranged from 44-559 per 100,000 in di erent parts of the country during the past decade. A single most important modi able risk factor for stroke is hypertension. A reduction of 10 mmHg and 5 mmHg in respectively Systolic and Diastolic BP may bring about a 40% reduction in risk for stroke. He advised that the diabetics or kidney patients must target their BP <140/90 or <130/80 and that e ect would be bene cial in more intensive control of SBP<120.

Elaborating why hypertension is said to be a silent killer, Dr. Chowdhury said that hypertension is o en underdiagnosed and undertreated, compliance with the medication is also poor, and proper risk evaluations are also not done. In a large study conducted in South Asia on awareness, treatment, and control of hypertension it was found that 45 % of people in urban and 32 % in rural areas were aware of hypertension; 37% in urban and 23% in rural areas were treated and only 15% in urban and 9% in rural areas had achieved control of hypertension which was not satisfactory.

Dr. Chowdhury discussed the correct way of measuring BP and also explained factors a ecting readings of BP. Talking about risk evaluation; he listed out many factors such as obesity, salt intake, dietary history, smoking, alcohol, physical activity, stress, and sleep that might a ect the BP. He showed how every additional risk factor may increase the severity of hypertension.

At the end of his talk, Dr. Chowdhury proposed Lifestyle Modi cations and Behavioural erapy for controlling hypertension. He also mentioned Joint National Committee (JNC)-8 Guidelines for the management of hypertension.

Dr. R Roshan, DC, CISF raised a question on the reliability of instruments for measuring BP. To resolve

this issue, Dr. Chowdhury suggested noting the consistency of recordings so that proper standardization could be made.

Replying to a query from Sh. Shanker Jaiswal, Dr. Chowdhury said low BP or Hypotension is by and large not a major problem and can be managed easily by adequate intake of liquids. To another question on the quantity of salt to be consumed, Dr. Chowdhury felt that the use of salt should preferably be reduced by half while cooking. One should also be aware of other sources of salt such as salty nuts and snacks. He cautioned against adding salt from the top while eating. A simple calculation of the requirement of salt per member can be done by dividing the monthly consumption of salt by total members in the family.

Sh. Santosh Mehra appreciated the inclusion of studies done on policemen from Haryana and Bengal. He wondered with 81 % prevalence of hypertension in Haryana Police, what kind of awareness would be there. Referring to some reports, Sh. Mehra asked whether a BP of 140/90 mm Hg could be considered normal. Dr. Chowdhury clari ed that ideally the BP should be kept below 130/80. But under some speci c conditions such as kidney/renal failure, a BP level of 140/90 could be allowed.

CURRENT STATUS OF HYPERTENSION & STROKE IN THE COUNTRY AND EVALUATION OF RISK FACTORS WITH PARTICULAR REFERENCE TO LIFESTYLE

DR DEBASHISH CHOWDHURY
DIRECTOR PROFESSOR &
HEAD OF NEUROLOGY

GB PANT INSTITUTE OF POST GRADUATE MEDICAL EDUCATION AND RESEARCH, NEW DELHI

HYPERTENSION: THE SILENT KILLER

Affects more than one billion individuals
and causes an estimated 9.4 million deaths per year

HT is associated with a doubling of the risk of death from

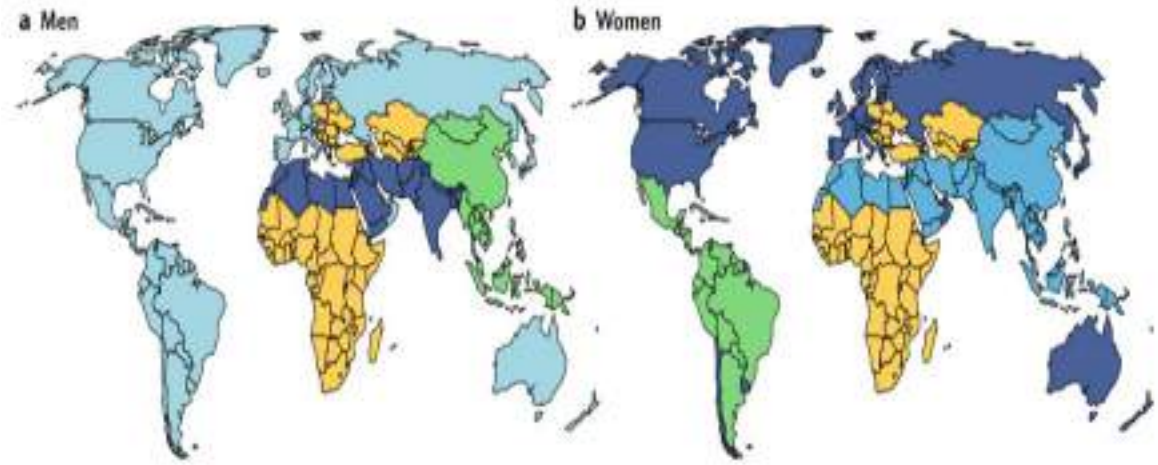
a. Stroke
b. Heart Disease
c. Peripheral Vascular Disease
d. Kidney Disease

Lowering high BP prevents death and disability

HYPERTENSION

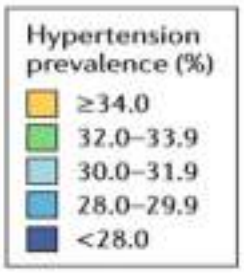
	JNC 7, 2003	ACC/AHA, 2017
Normal	< 120 / 80	< 120 / 80
Pre-hypertension	120-139 / 80-89	120-129 / < 80
Stage 1 hypertension	140-159 / 90-99	130-139 / 80-89
Stage 2 hypertension	≥ 160 / 100	≥ 140 / 90
BP targets	<140 / 90 <130 / 80 (CKD or Diabetes)	≤ 130 / 80

HYPERTENSION EPIDEMIOLOGY



In 2010, a total of 1.38 billion people (31.1% of the global adult population) had hypertension, defined as SBP ≥140 mmHg and/or DBP ≥90 mmHg

Mills et al, Nature, 2020



Review

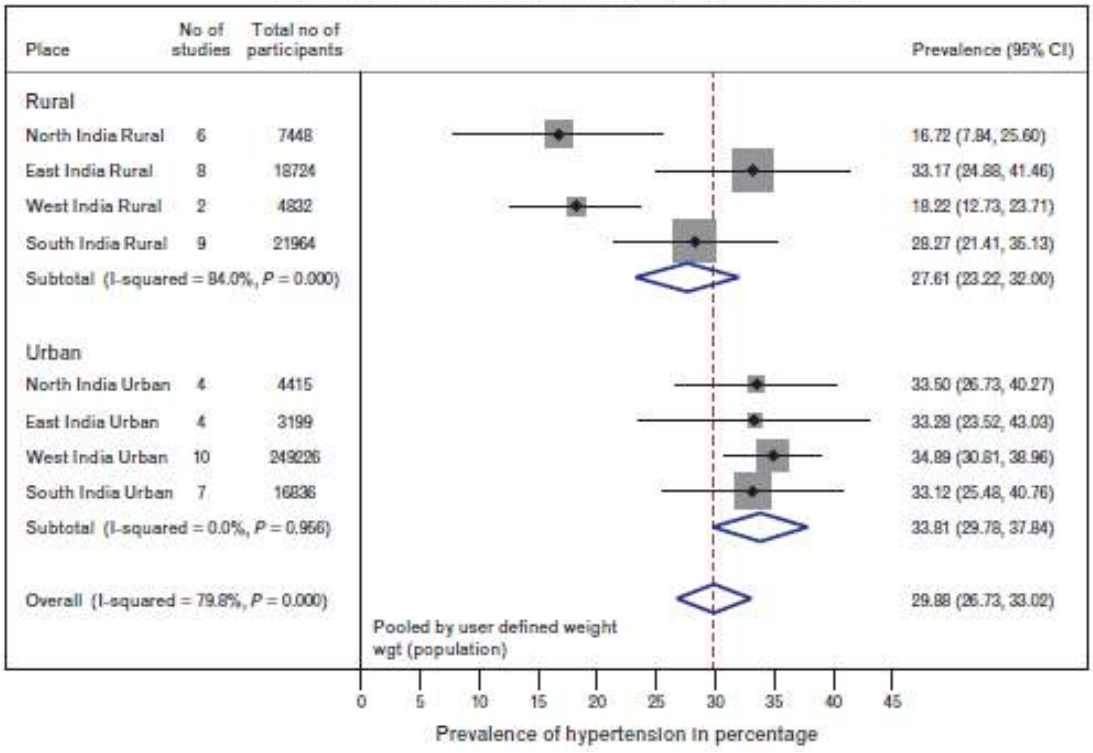
OPEN

Hypertension in India: a systematic review and meta-analysis of prevalence, awareness, and control of hypertension

Volume 32 • Number 6 • June 2014

Raghupathy Anchala[a,b], Nanda K. Kannuri[b], Hira Pant[b], Hassan Khan[a], Oscar H. Franco[c], Emanuele Di Angelantonio[a], and Dorairaj Prabhakaran[d]

Prevalence of hypertension in India (rural vs urban)

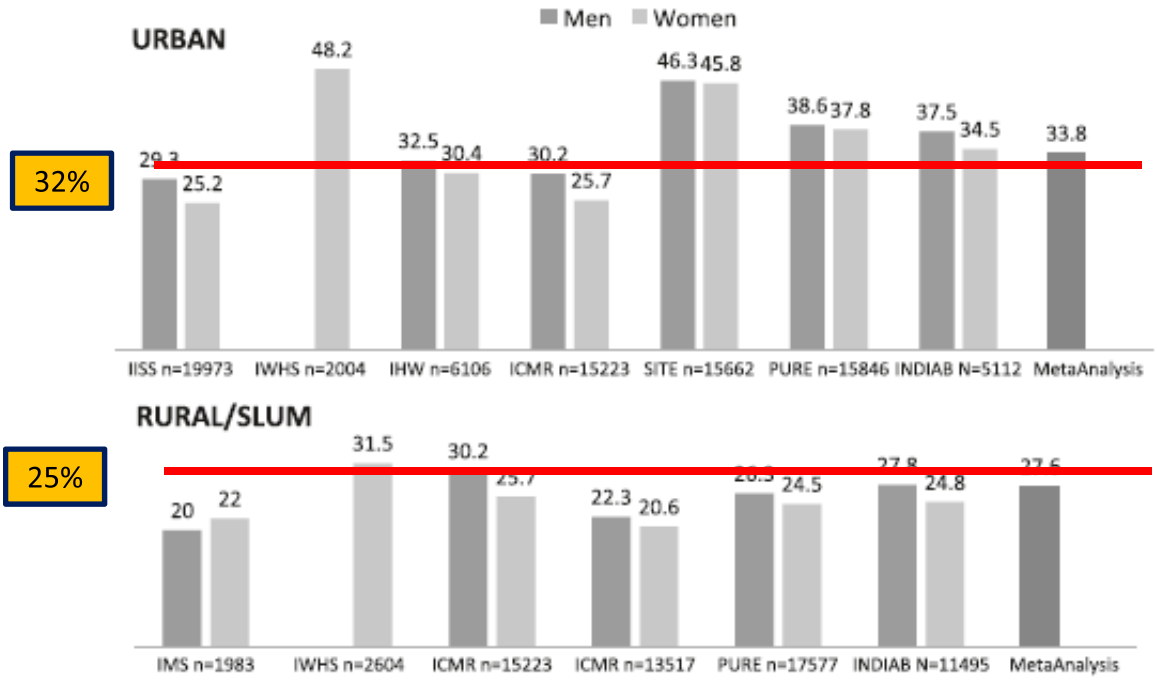


Journal of Human Hypertension (2019) 33:575–587
https://doi.org/10.1038/s41371-018-0117-3

REVIEW ARTICLE

Emerging trends in hypertension epidemiology in India

Rajeev Gupta[1] · Kiran Gaur[2] · C. Venkata S. Ram[3,4]



Fourth round of the National family health survey NFHS-4

Open access Original research

BMJ Open

Prevalence and associated risk factors of hypertension among persons aged 15–49 in India: a cross-sectional study

Soumitra Ghosh , Manish Kumar

Table 2 Prevalence of hypertension in India, 2015–2016

	Unadjusted		Adjusted	
Prevalence	%	CI	%	CI
Overall	10.5	10.37 to 10.62	11.3	11.16 to 11.43
Male	14.3	13.97 to 14.70	13.8	13.46 to 14.19
Female	10.1	09.96 to 10.22	10.9	10.79 to 11.06
Rural	9.8	9.09 to 9.94	10.6	10.50 to 10.78
Urban	11.8	11.12 to 12.12	12.5	12.25 to 12.80

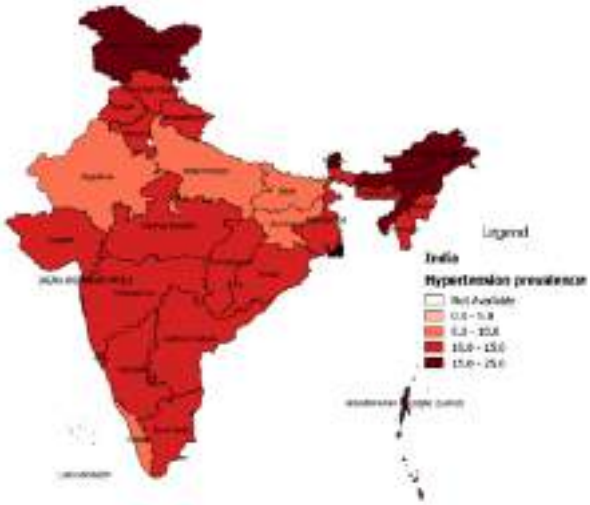


Figure 1 Prevalence of hypertension across states, India, 2015–2016.

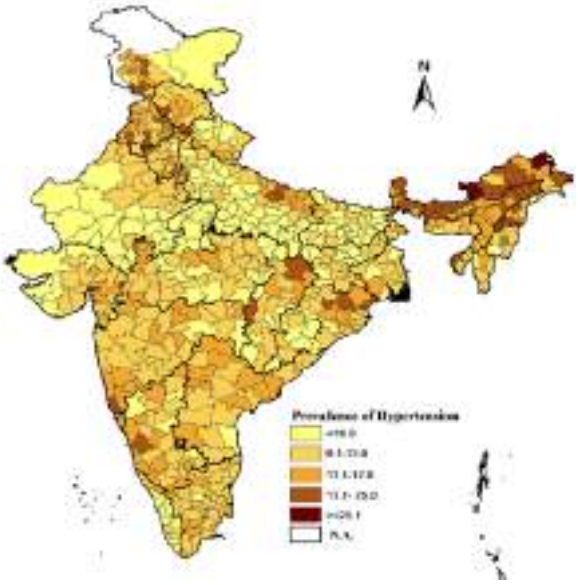


Figure 2 Prevalence of hypertension across districts, India, 2015–2016.

JAMA Internal Medicine | Original Investigation

Diabetes and Hypertension in India

A Nationally Representative Study of 1.3 Million Adults

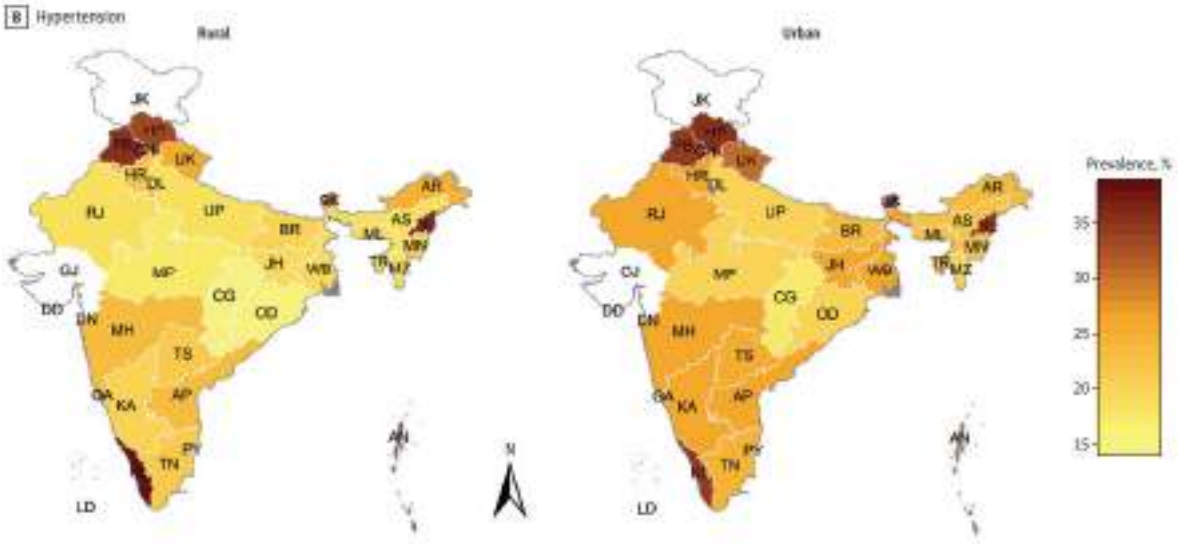
Pascal Geldsetzer, MPH; Jennifer Manne-Goehler, MD; Michaela Theilmann, BA; Jennifer L. Davies, MD; Ashish Awasthi, PhD; Sebastian Vollmer, PhD; Lindsay M. Jaacks, PhD; Till Bärnighausen, MD; Bilal Atun, FRCP

JAMA Intern Med. doi:10.1001/jamainternmed.2017.8094
Published online January 29, 2018.

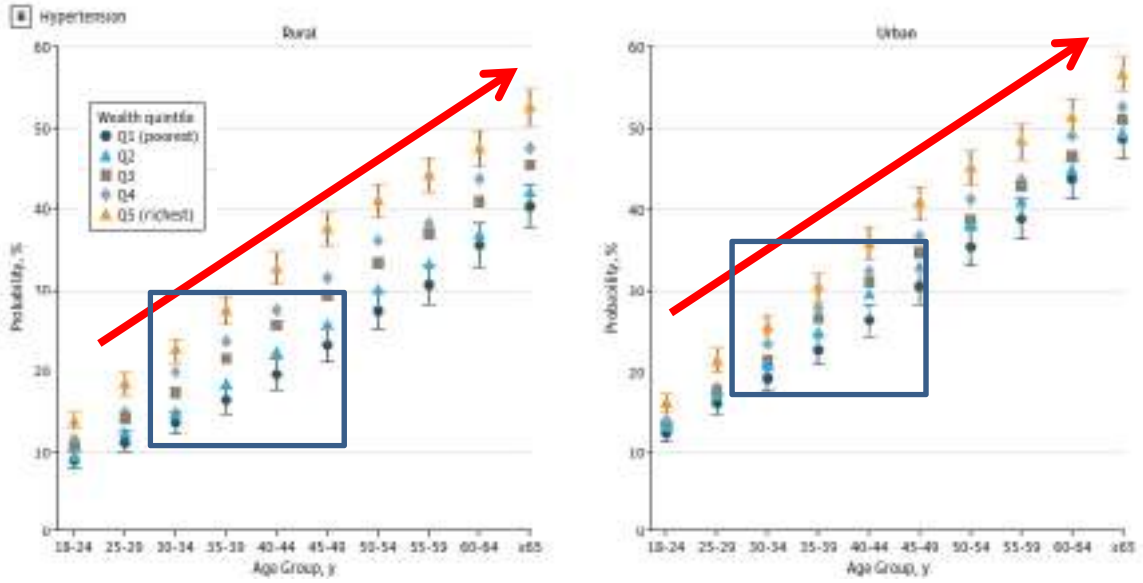
District level household survey-4 and annual health surveys

A more robust study employing district level health data has been developed by Government of India to estimate important cardiovascular risk factors (overweight, obesity, hypertension, diabetes) in all states of the country among all population groups

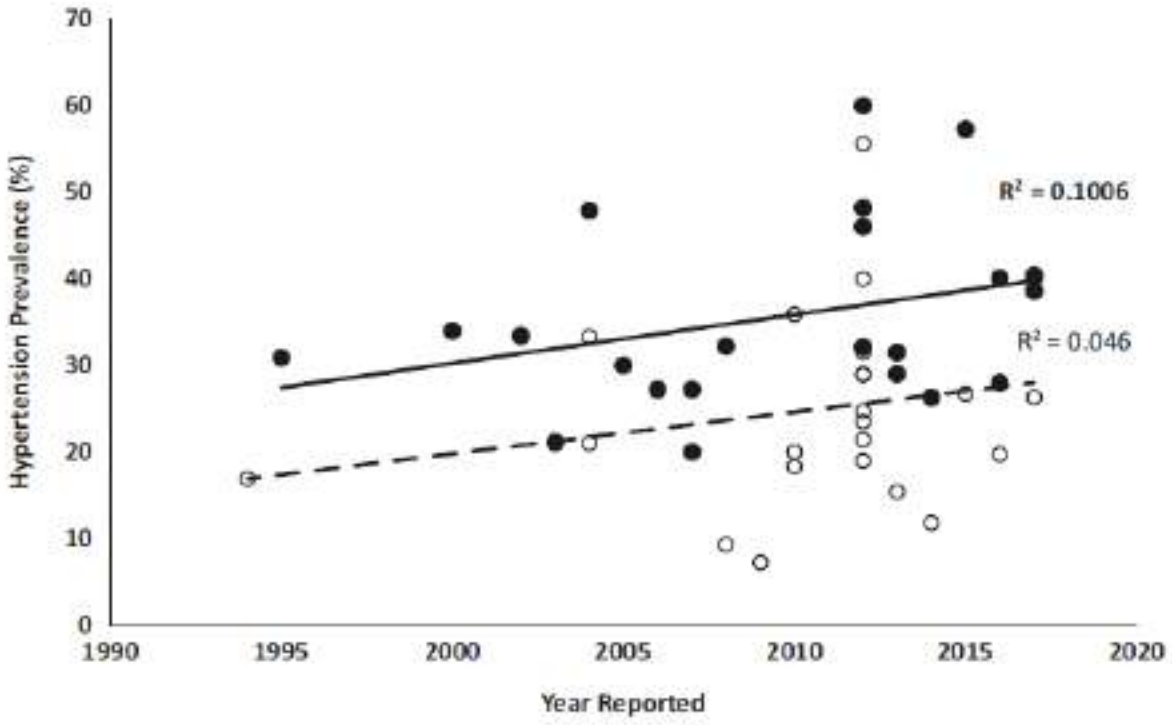
Age-standardized prevalence was also significantly greater in men (24.5%, CI 24.2–24.9%) as compared with women (20.0%, CI 19.7–20.3%).



The Predicted Probability of Diabetes and Hypertension by Age Group, Rural or Urban Location, and Household Wealth Quintile



INCREASING TREND INHYPERTENSION IN INDIA



Gupta et al, 2019 Journal of Human Hypertension (2019) 33:575–587

WHAT ABOUT THE POLICE FORCEIN THE COUNTRY?

Hypertension, Prehypertension and Normotension among Police Personnel in a District of West Bengal, India

Debabrata Mallik[1], Dipta Kanti Mukhopadhyay[1], Pranav Kumar[2], Apurba Sinhababu[3]

[1]Assistant Professor, B.S. Medical College, Bankura; [2]IPS, SP, Special Crime Branch, CBI, Lucknow; 3Professor, RG Kar Medical College, Kolkata

Received: 08.10.2013; Accepted: 12.11.2013

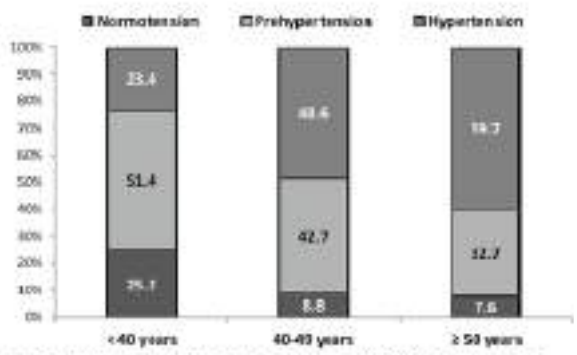


Fig. 1 : Age-group wise distribution of different grades of blood pressure among study population (N = 1817)

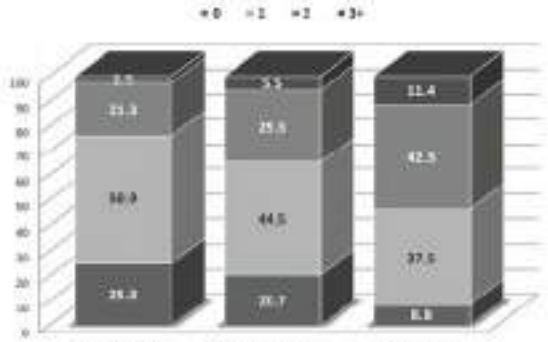


Fig. 2 : Clustering of cardiovascular risk factors among study population with different grades of blood pressure (N = 1817)

International Journal of Applied & Basic Medical Research
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Int J Appl Basic Med Res. 2019 Jul-Sep; 9(3): 143–147.
doi: 10.4103/ijabmr.IJABMR_356_18: 10.4103/ijabmr.IJABMR_356_18
PMCID: PMC6652270
PMID: 31392176

Prevalence of Hypertension and its Determinants among Policemen in a City of Haryana, India

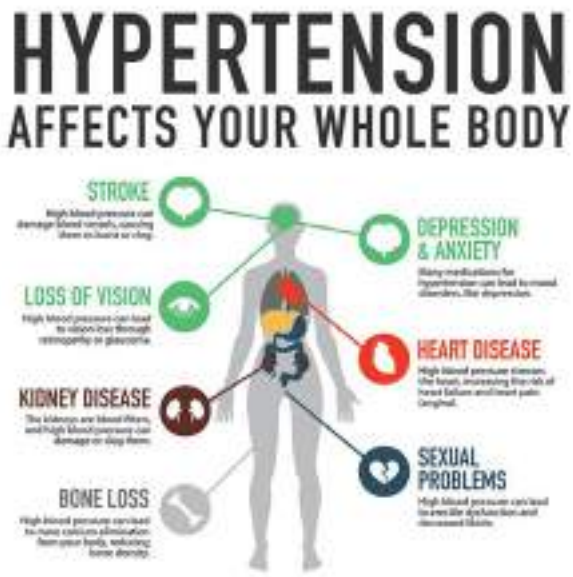
Jai Parkash, Meenakshi Kalhan,[1] Komal Singhania,[1] Anita Punia,[2] Brijesh Kumar,[1] and Pankaj Kaushal[1]

Table 1

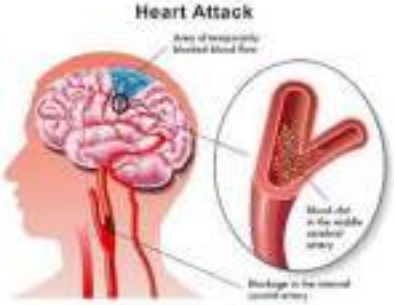
Distribution of the study participants according to hypertension (*n*=450)

	Frequency (%)
HTN	
Yes	164 (36.4)
No	286 (63.6)
Known case of HTN	
Yes	83 (18.4)
No	367 (81.6)
Regularly taking medicines (*n*=83)	
Yes	36 (43.4)
No	47 (56.6)

Rank		
Constable	Reference	
Head constable	0.780 (0.248-2.449)	
Assistant subinspector	0.564 (0.162-1.971)	
Subinspector and above	1.357 (0.514-3.578)	


HYPERTENSION
AFFECTS YOUR WHOLE BODY
STROKE
DEPRESSION & ANXIETY
LOSS OF VISION
HEART DISEASE
KIDNEY DISEASE
SEXUAL PROBLEMS
BONE LOSS


Block in Artery
Muscle Damage


Heart Attack

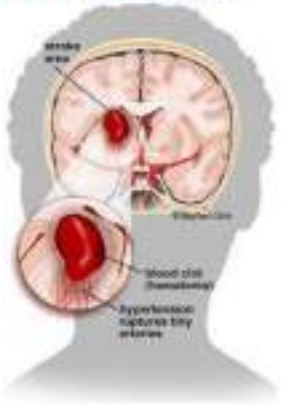
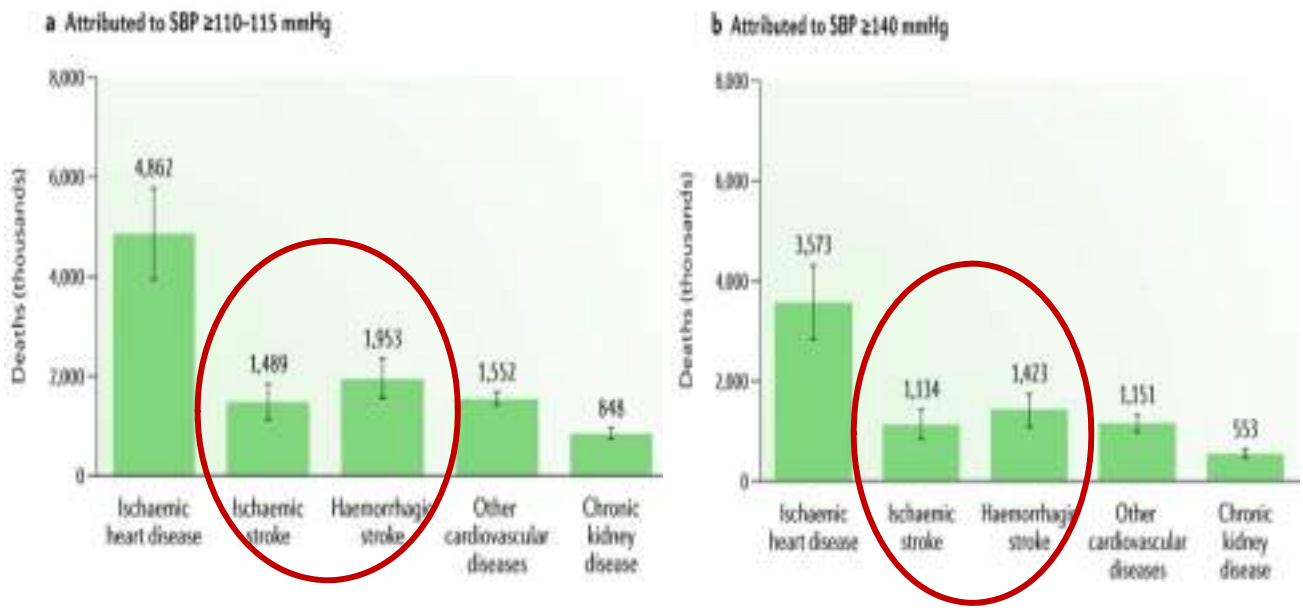


Table 4. Risk factors for hypertension (community-based studies)

Risk factor	*Odds ratio (range)*	*Reference*
Age		
40–49	1.75–4.39	Manimunda *et al.*,[24] Hazarika *et al.*[19]
50–59	2.62–8.17	Hazarika *et al.*,[16] Thankappan *et al.*[12]
⩾60	4.07–13.45	Mohan *et al.*[61a]
Body mass index	1.12–4.10	Shanthirani *et al.*,[57a] Manimunda *et al.*[24]
Waist circumference	1.84	Thankappan *et al.*[12]
Waist–hip ratio	1.54–2.83	Hazarika *et al.*,[16] Hazarika *et al.*[19]
Extra salt intake	1.45–1.76	Hazarika *et al.*,[16] Hazarika *et al.*[19]
Alcohol	1.01–2.33	Shanthirani *et al.*,[57a] Hazarika *et al.*[19]
Smoking	0.72–1.66	Thankappan *et al.*,[12] Shanthirani *et al.*[57a]
Glucose intolerance	4.26	Shanthirani *et al.*[57a]
Diabetes mellitus	2.12	Thankappan *et al.*[12]
Hypercholesteremia	2.08	Mohan *et al.*[61a]

[a]Reference numbers 61, 57 are provided in the Supplementary Information.

DEATH ATTRIBUTABLE TO HTN



14% of all cause of death was associated with hypertension (SBP ≥140 mmHg) in 2014

Mills et al, Nature, 2020

INCREASE HAZARD OF UNFAVOURABLE OUTCOME IN PERSONS WITH HYPERTENSION

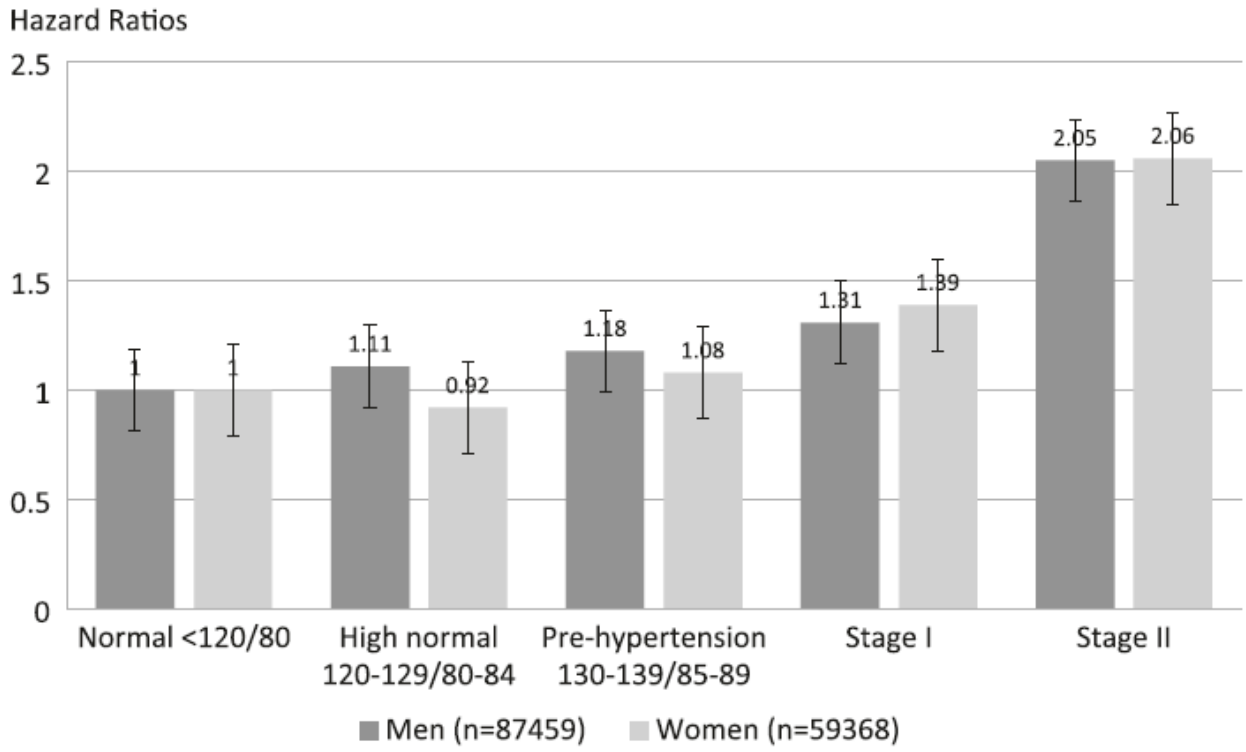


Table 5 Increasing trends in deaths and disability adjusted life years (DALYs) due to high systolic blood pressure in India (Global Burden of Diseases Study 2016)

	1990	1995	2000	2005	2010	2016
Deaths						
Absolute numbers (thousands)	784.7	885.3	1005.0	1153.6	1385.6	1634.7
Death Rate/ 100,000	90.8	92.7	95.9	101.3	113.1	124.2
% of total deaths	8.9	9.9	10.8	12.2	14.4	16.7
DALY's						
Absolute numbers (millions)	20.9	23.4	26.2	29.3	34.4	39.4
DALY Rate/ 100,000	2415	2451	2497	2576	2807	3000
% of total DALYs	3.9	4.4	5.0	5.7	7.0	8.5

STROKE

Global, regional, and national burden of stroke, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016

GBD 2016 Stroke Collaborators*

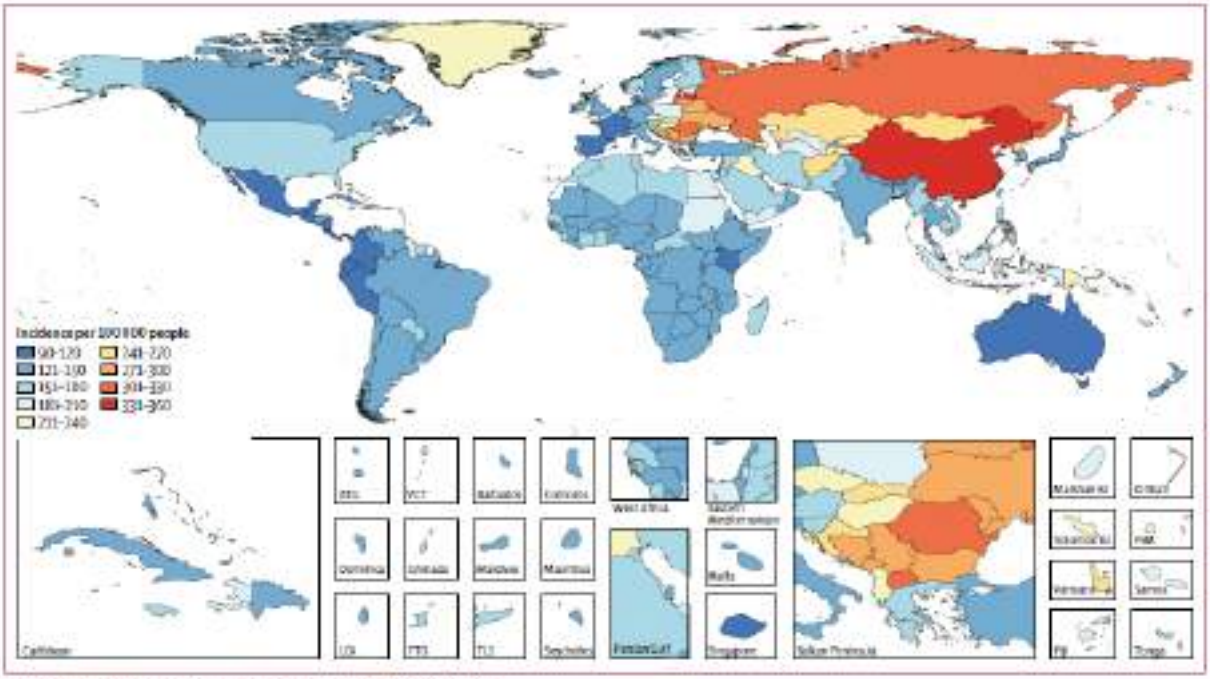


Figure 1: Age-standardised stroke incidence by country, for both sexes, 2016
ATG=Antigua and Barbuda. FSM=Federated States of Micronesia. SI=Islands. LCA=Saint Lucia. VCT=Saint Vincent and the Grenadines. TLS=Timor-Leste. TTO=Trinidad and Tobago.

Global, regional, and national burden of stroke, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016

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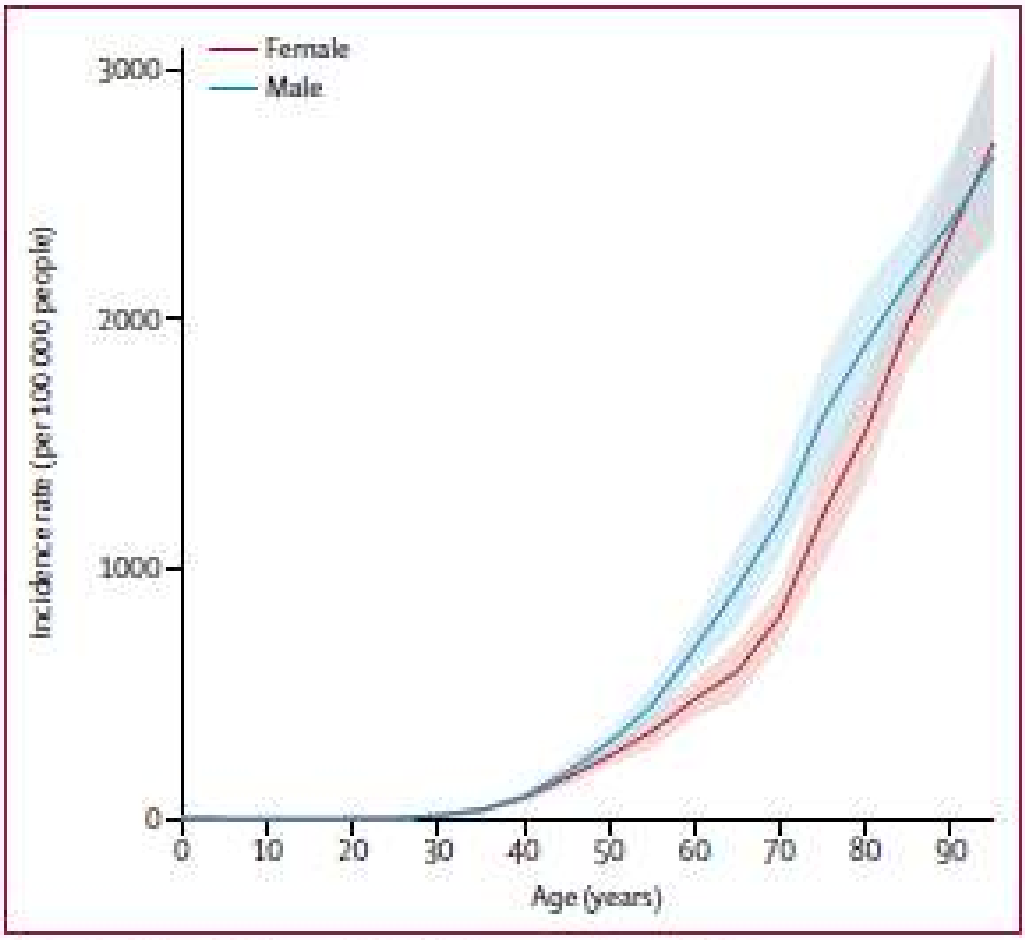

Figure 2: Global incidence of stroke by age and sex, 2016

IJMR Indian Journal of Medical Research

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Indian J Med Res. 2017 Aug; 146(2): 175–185.
doi: 10.4103/ijmr.IJMR_516_15; 10.4103/ijmr.IJMR_516_15

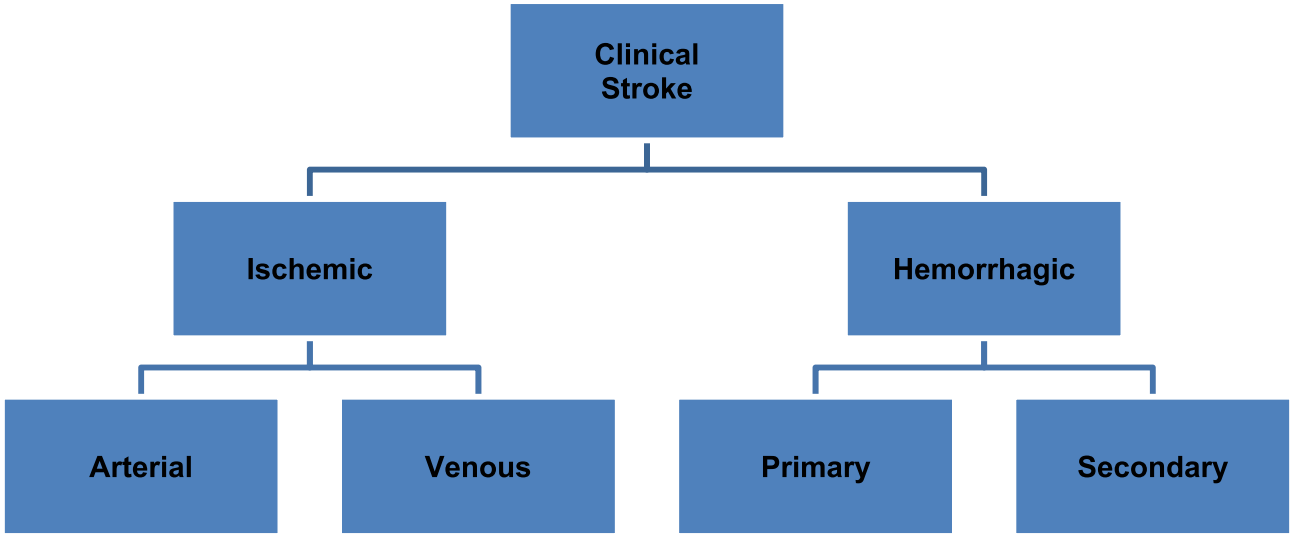
PMCID: PMC5761027
PMID: 29265018

Incidence & prevalence of stroke in India: A systematic review

Sureshkumar Kamalakannan,[1] Aashrai S. V. Gudlavalleti,[2] Venkata S. Murthy Gudlavalleti,[1] Shifalika Goenka,[3] and Hannah Kuper[1]

The cumulative incidence of stroke ranged from 105 to 152/100,000 persons per year, and the crude prevalence of stroke ranged from 44.29 to 559/100,000 persons in different parts of the country during the past decade. These values were higher than those of high-income countries.

CLASSIFICATION OF STROKE



JoS
JOURNAL OF STROKE

Journal of Stroke 2013;15(3):128-134
http://dx.doi.org/10.5853/jos.2013.15.3.128

Review

Stroke Epidemiology and Stroke Care Services in India

Jeyaraj Durai Pandian,[a] Paulin Sudhan[b]

[a]Professor and Head, Department of Neurology, Christian Medical College, Ludhiana, Punjab, India
[b]Research Co-ordinator, Department of Neurology, Christian Medical College, Ludhiana, Punjab, India

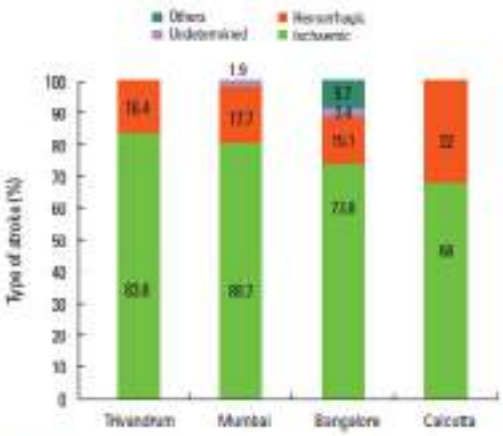


Figure 2. Distribution of stroke subtypes in the various incidence studies

Risk factors: It has been estimated that hypertension causes 54% of stroke in low-income and middle-income countries, followed by hypercholesterolemia (15%) and tobacco smoking (12%).[14] In the Mumbai registry, 82.8% of patients had hypertension. However, verifiable data for other risk factors were not available.[10] In the Trivandrum registry, nearly 85% had hypertension, half had diabetes mellitus, 26% had dyslipidemia and 26.8% of men smoked tobacco. Compared to urban males, more rural males smoked tobacco (22.8% vs. 39.3%, $P=0.013$). One risk factor was present in 38.4% patients, two in 42.0%, and three or more in 14.4% patients.[13]

Ischemic Stroke Profile, Risk Factors, and Outcomes in India

The Indo-US Collaborative Stroke Project

P.N. Sylaja, MD, DM; Jeyaraj Durai Pandian, MD, DM; Subhash Kaul, MD, DM; M.V. Padma Srivastava, MD, DM; Dheeraj Khurana, MD, DM; Lee H. Schwamm, MD; Praveen Kesav, MD, DM; Deepti Arora, BAMS, MSc; Aman Pannu, PhD; Tijy K. Thankachan, BA; Aneesh B. Singhal, MD

Risk factors	
Hypertension	1257 (60.8%)
Diabetes mellitus	737 (35.7%)
Coronary artery disease	349 (16.9%)
Hypercholesterolemia	298 (14.4%)
Nonvalvular atrial fibrillation/flutter	82 (4.0%)
Rheumatic heart disease	115 (5.6%)
Prior transient ischemic attack	159 (7.7%)
Prior ischemic/hemorrhagic stroke	410 (19.8%)

HYPERTENSION AND STROKE

KNOW YOUR BLOOD PRESSURE

- Single most important modifiable risk factors for stroke is hypertension
- **SBP reduction of 10 mm hg & DBP reduction of 5 mmHg is associated with 40% reduction in stroke risk**
- Target BP <140/90 or <130/80 (diabetic and CKD)
- Effect is also beneficial in more intensive control of SBP<120

HYPERTENSION: THE SILENT KILLER

- Under-diagnosed
- Undertreated
- Poor compliance
- Risk associations not evaluated

Review

OPEN

Hypertension in India: a systematic review and meta-analysis of prevalence, awareness, and control of hypertension

Raghupathy Anchala[a,b], Nanda K. Kannuri[b], Hira Pant[b], Hassan Khan[a], Oscar H. Franco[c], Emanuele Di Angelantonio[a], and Dorairaj Prabhakaran[d]

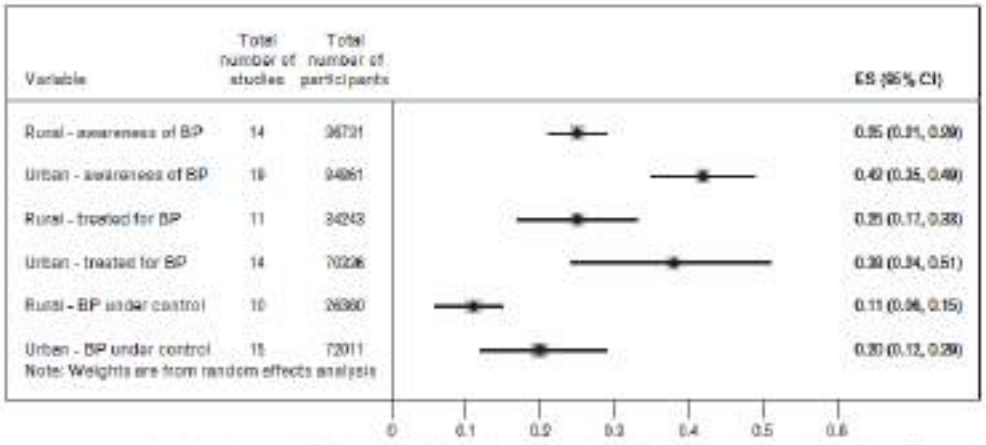


FIGURE 3 Percentage aware, treated, and under control for hypertension (HTN): urban and rural areas. *P* value for overall rural and urban differences in awareness of hypertension = 0.002*; *P* value for rural and urban differences in HTN treatment = 0.112; *P* value for rural and urban differences in HTN control = 0.03*. BP, blood pressure; CI, confidence interval; ES, pooled estimate; *Statistically significant.

PROSPECTIVE URBAN RURAL STUDY

Curr Opin Cardiol 2019, 34:331–341
DOI:10.1097/HCO.0000000000000632

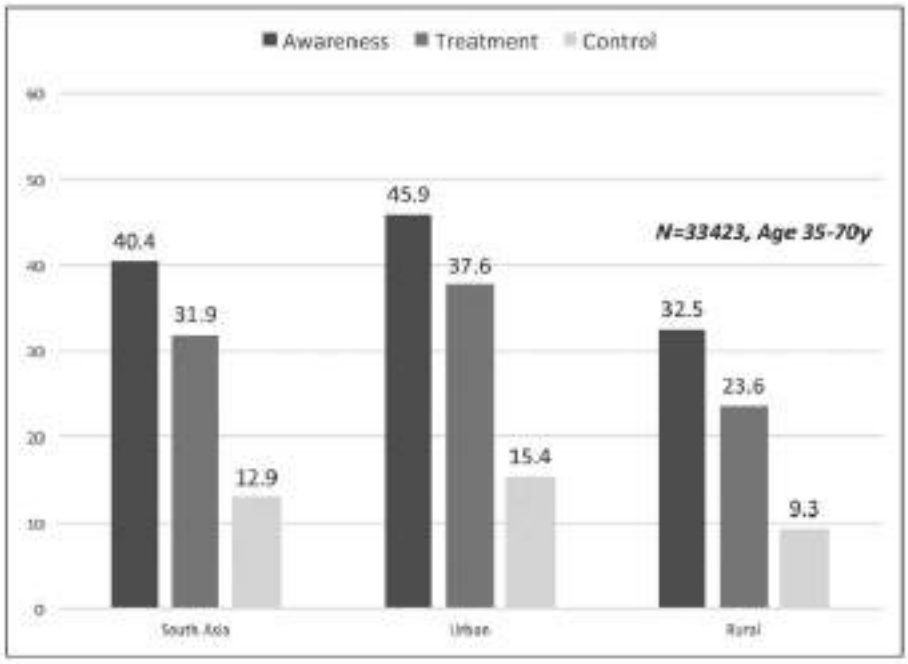
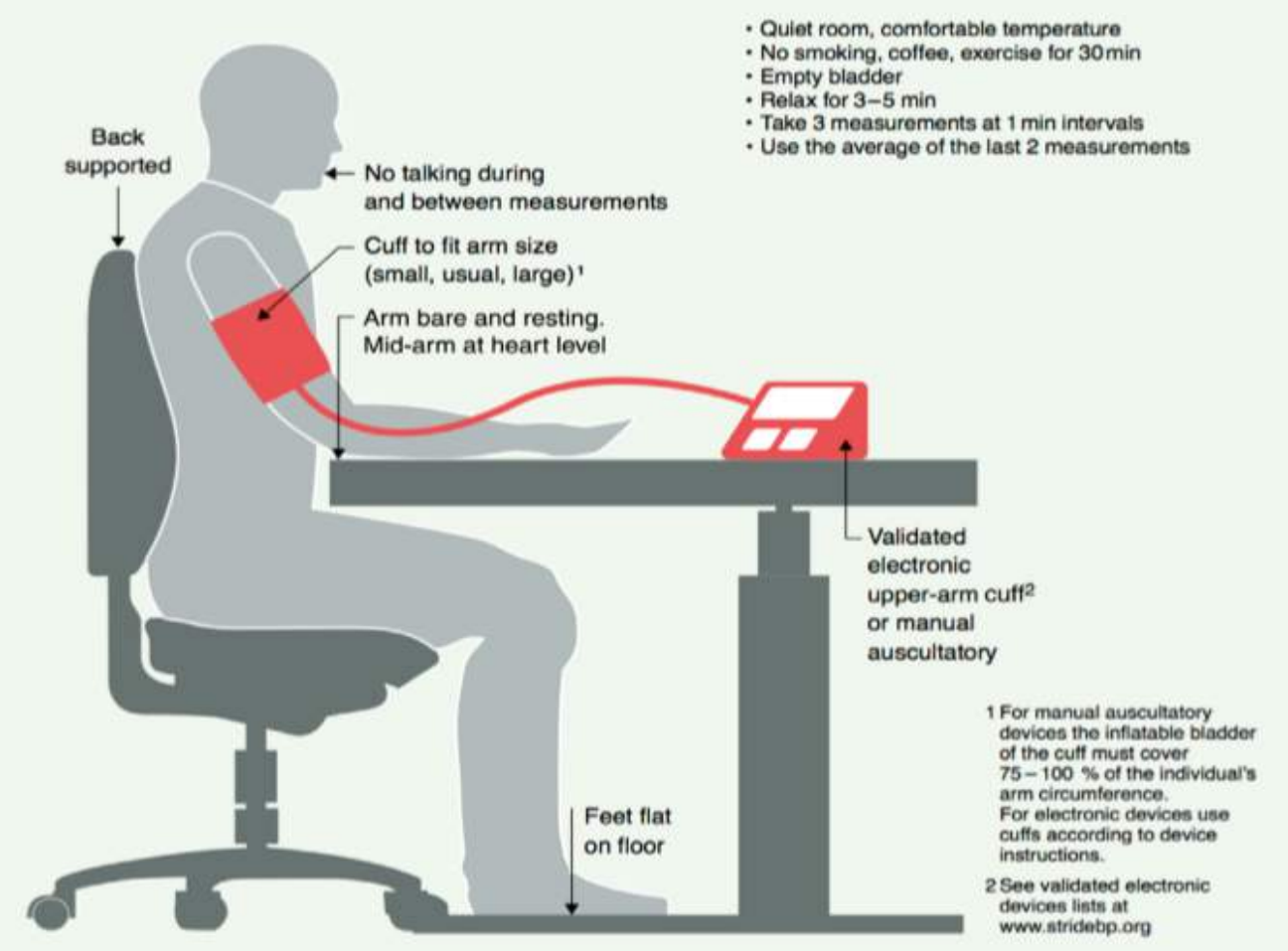


FIGURE 4. Hypertension awareness, treatment and control study in South Asian cohort of Prospective Urban Rural Epidemiology Study [55].

EVALUATION

BP MEASUREMENT



Factors Afecting Blood Pressure Readings

Variance ↓ (mmHg)	Cause of Variance	Variance ↑ (mmHg)
	Cuff is too small	10-40
10-40	Cuff over clothing	10-40
	Back/feet unsupported	5-15
	Legs crossed	5-8
	Not resting 3-5 minutes	10-20
	Patient talking	10-15
	Labored breathing	5-8
	Full bladder	10-15
	Pain	10-30
	Arm below heart level	1.8/inch
1.8/inch	Arm above heart level	

AHA SCIENTIFIC STATEMENT

Measurement of Blood Pressure in Humans

A Scientific Statement From the American Heart Association

(*Hypertension*. 2019;73:e35–e66. DOI: 10.1161/HYP.0000000000000087.)

BP MEASUREMENTS

- White coat vs Masked
- Frequency
- Device
- 24 hour ambulatory

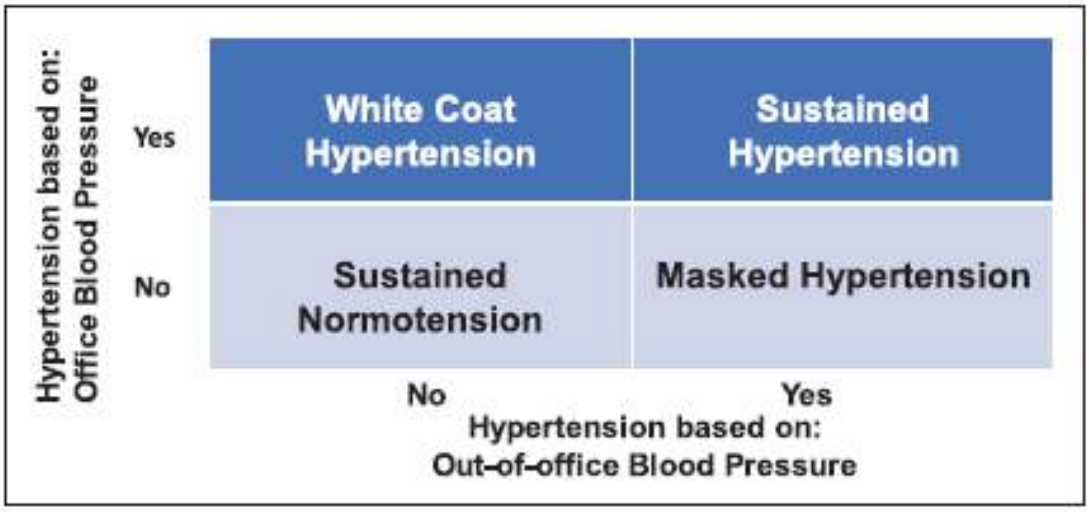


Figure 1. Cross-classification of office and out-of-office hypertension. Out-of-office hypertension is defined on the basis of home blood pressure (BP) monitoring or ambulatory BP monitoring. Reprinted from Pickering et al[86] with permission. Copyright © 2008, Wolters Kluwer Health.

EVALUATION OF RISK FACTORS

- Obesity (measure BMI)
- Salt intake
- Dietary history: fruits, vegetables, low fat
- Smoking
- Alcohol
- Exercise/ physical activity
- Stress
- Sleep

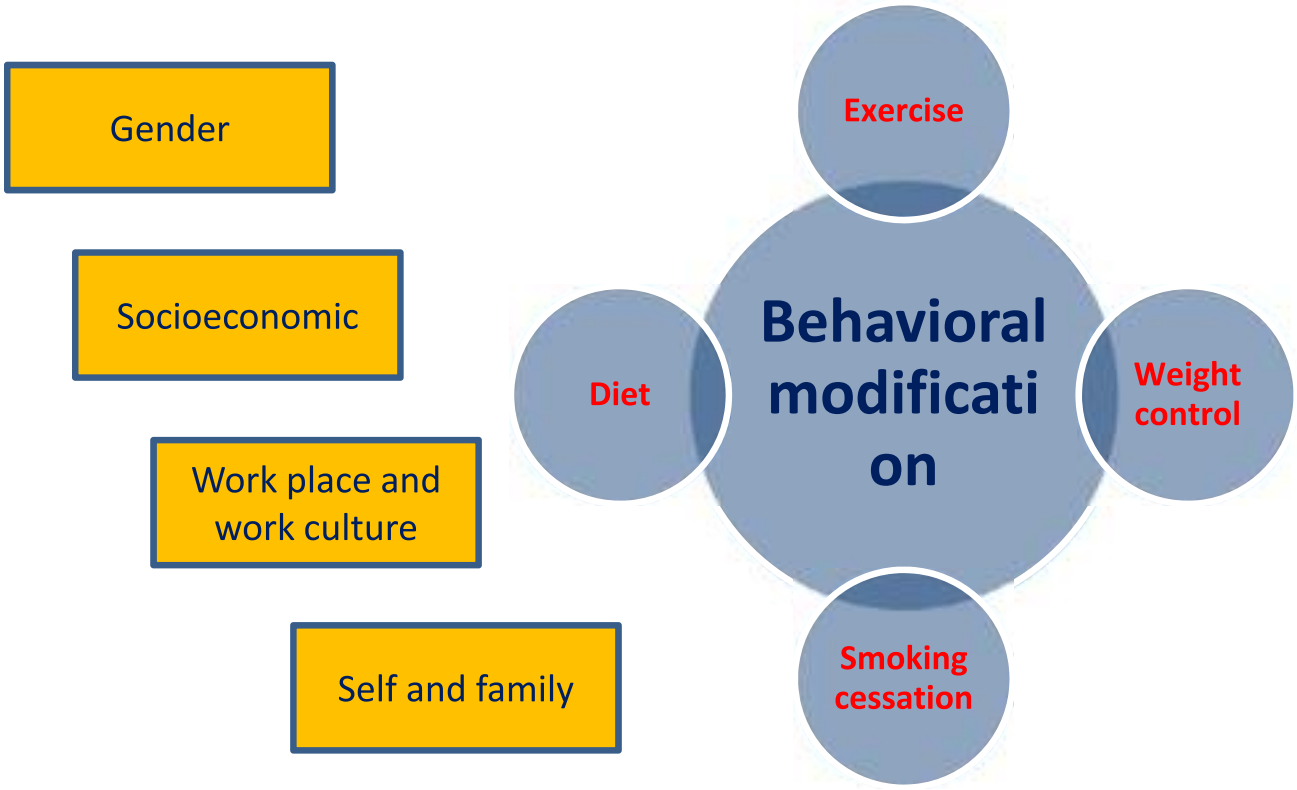
LABORATORY INVESTIGATIONS

- 12-lead ECG
- Fundoscopy
- Blood: KFT, FBS, lipid profile, SE (Na, K)
- Urine: Protein estimation (microalbumuria) & RE/ME
- Renal USG and doppler

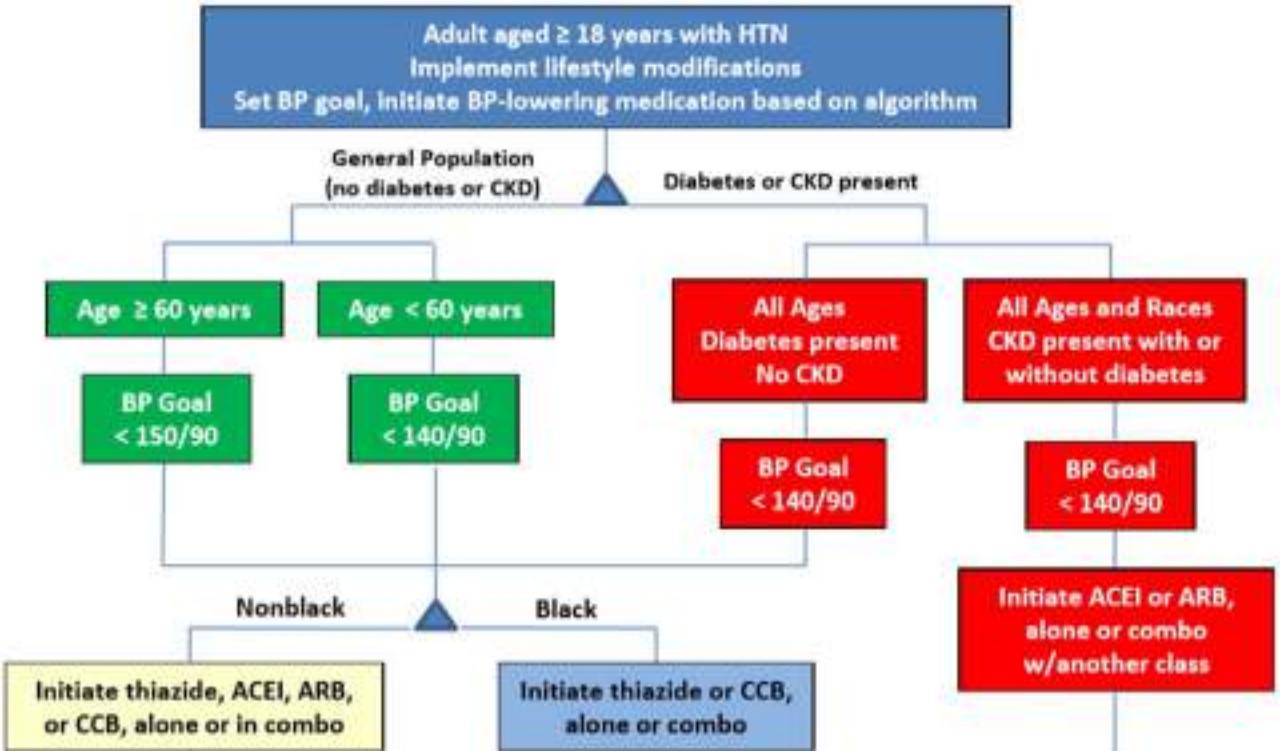
RISK ASSESSMENT IN PRESENCE OF HTN

Other Risk Factors, HMOD, or Disease	High-Normal SBP 130–139 DBP 85–89	Grade 1 SBP 140–159 DBP 90–99	Grade 2 SBP ≥160 DBP ≥100
No other risk factors	Low	Low	Moderate / High
1 or 2 risk factors	Low	Moderate	High
≥3 risk factors	Low / Moderate	High	High
HMOD, CKD grade 3, diabetes mellitus, CVD	High	High	High

LIFESTYLE MODIFICATION & BEHAVIORAL THERAPY



JNC-8 GUIDELINE



- Recurrent stroke prevention: ACEI, diuretics
- Up-titrate dose/use combination/strict adherence/lifestyle modification
- Add another class of agents (beta blocker, aldosterone antagonist)

TWO FACES OF OUR FORCE

Sachin Atulkar

Dr Muffazal Lakdawala, treated Inspector Daulatram Jogawat

Management of high BP and STROKE

Dr. Kameshwar Prasad, the second speaker of the webinar talked on the important issue of "Management of High BP and Stroke". He started by explaining the major blood vessels of the brain. e supply vessels to the brain are known as arteries and the drainage vessels of the brain are known as veins. When one of the vessels either leaks or is choked, this results in Stroke, Lakva, or Brain Attack. A stroke happens suddenly and the a ected area of the brain stops working. A stroke could be either arterial or venous depending upon the involvement of artery or vein. In our country, many people die of stroke and according to the gures released by the Central Bureau of Health Intelligence, DGHS, more than six lakh deaths were attributed to stroke only in 2004.

Venous stroke is related to pregnancy or a er-delivery complications, mainly dehydration. Smoking particularly with oral contraceptive use could be another reason for venous stroke.

Discussing two types of arterial strokes, Dr. Prasad explained that a stroke due to blockage happens when a clot blocks the ow of blood to an area of the brain. is is also known as **Ischemic stroke**. A stroke due to leakage happens when blood leaks out of the artery. is is also known as a **Brain Hemorrhage**. e part of the brain that does not receive blood supply stops working and as a result the body parts controlled by this part of the brain, also become non-functional. Showing a CT scan of the a ected part of the brain, Dr. Prasad explained the process of Ischaemic stroke and Brain Haemorrhage.

Dr. Prasad elaborated upon the reasons for blood clot formation by giving illustrations. Some of these reasons could be (i) the Narrowing of blood vessels due to deposition of fat, (ii) Narrowing of the artery due to Diabetes and Hypertension, (iii) Diseased heart throwing clots, and (iv) Some diseases that increase blood clot formation. He also discussed some of the risk factors responsible for causing a stroke. He mentioned "Hypertension" as a major risk factor for stroke followed by smoking, diabetes, and heart disease including high cholesterol, overweight, and obesity.

He classi ed Hypertension in four categories viz., Normal (SBP<130 & DBP<85 mm Hg); High Normal (SBP: 130-139 and/or DBP: 85-90 mm Hg); Grade 1 Hypertension (SBP: 140-159 and/or DBP: 90-99 mm Hg); and Grade 2 Hypertension (SBP≥160 and/or DBP≥100 mm Hg).

Describing symptoms of Stroke, Dr. Prasad mentioned trouble in walking, weakness on one side, trouble in seeing, and trouble in speaking as major symptoms of a stroke. Explaining further, he said sudden weakness or paralysis or numbness of the face, arm & leg on one or both sides of the body, loss of speech or di culty in speaking or understanding, and dimness or low vision, particularly only in one eye are the warning signs of stroke. Unexplained unsteadiness, and double vision, and sudden severe headache never experienced before, could also be the possible signs of stroke.

Regarding the treatment of stroke, Dr. Prasad laid a lot of emphasis on early recognition of critical symptoms so that the patient could be admitted to the hospital and a CT Scan of the brain is done to know the exact location of the area not receiving or inadequately receiving blood. e treatment involves dissolving or removal of the clot for restoring the blood supply. e faster the treatment is done faster would be the recovery. Further, Hemorrhagic Stroke requires urgent treatment. In some patients, surgery is done to remove the bleeding-related clot. As a preventive measure, Dr. Prasad advised all people aged 45 years or above to go for regular health check-ups for BP and Diabetes.

A er the stroke has occurred, supportive care for the patient becomes very important. e patient has to be given proper nutritional food. Walking and Physiotherapy are essential activities in the process of rehabilitation of the patient.

While concluding his talk, Dr. Prasad said time is extremely important. Do not waste time a er the patient has su ered a stroke. One must learn to recognize signs and symptoms of stroke to act fast.

Replying to a question from Sh. Shanker Jaiswal whether fat deposits in the blood vessels could be reversed, Dr. Prasad said a complete reversal is not possible by any means. However, it is possible to prevent it by avoiding a high-fat diet, controlling BP and Diabetes, and eating green vegetables. Doing yoga and other exercises may also help to some extent.

MANAGEMENT OF HIGH BP AND STROKE

KAMESHWAR PRASAD, MD,DM, FRCP
DIRECTOR, RAJENDRA INSTITUTE OF MEDICAL SCIENCES, RANCHI

(EX-PROFESSOR AND HEAD, DEPARTMENT OF NEUROLOGY AIIMS, NEW DELHI)

SACHIN TENDULKAR STROKES OF GENIUS

Edition of 100 Worldwide

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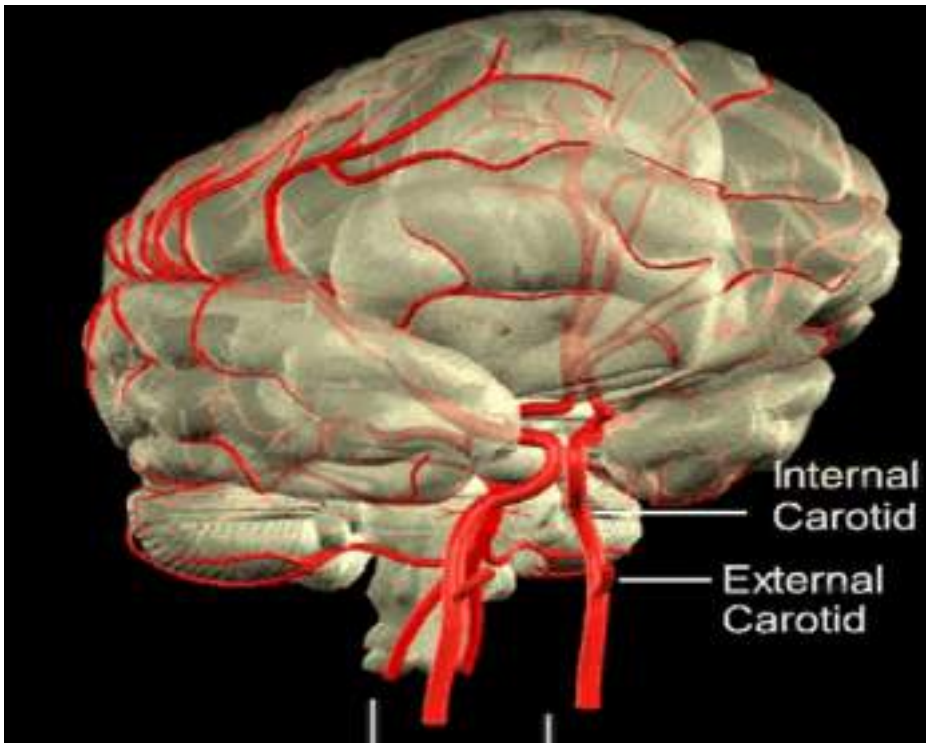
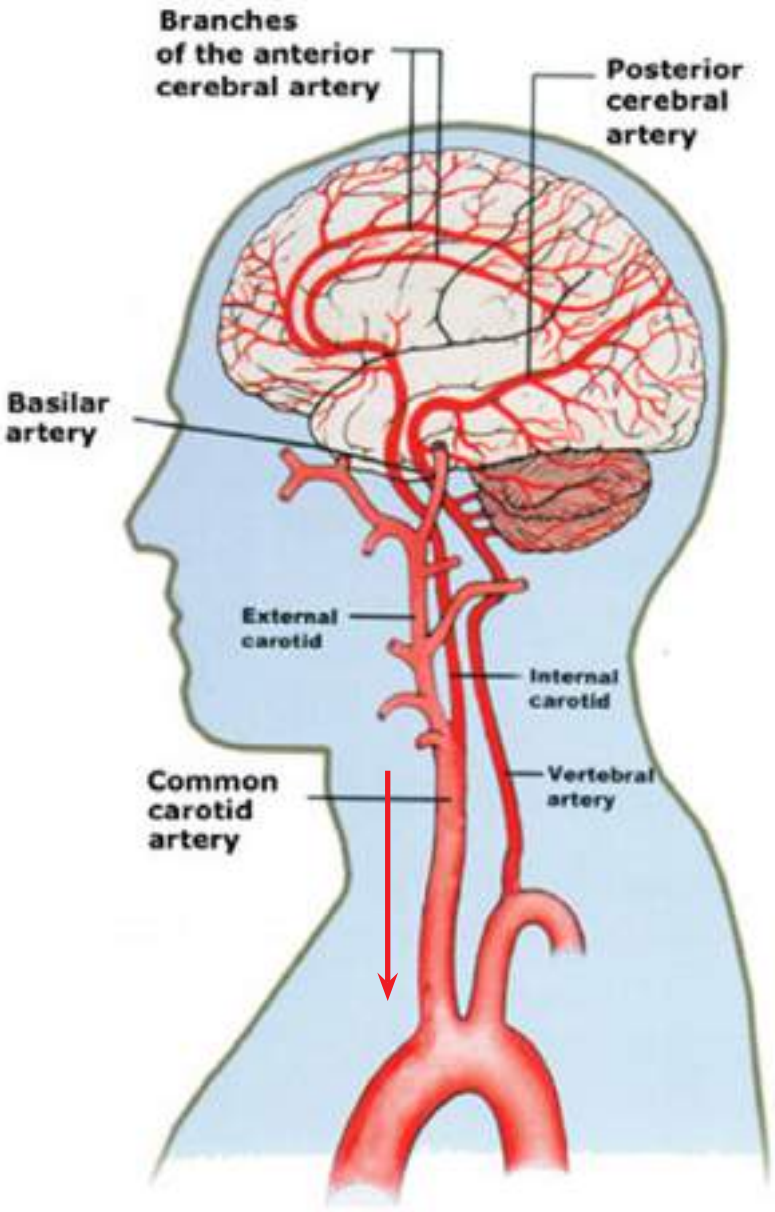
TENDULKAR'S 20 YEARS OF TEST CRICKET: DIFFERENT STROKES FOR DIFFERENT FOLKS!

Friday, November 13, 2009, 14:43 By Neo
This news item was posted in Cricket, Sports category and has 1 Comment and so far.

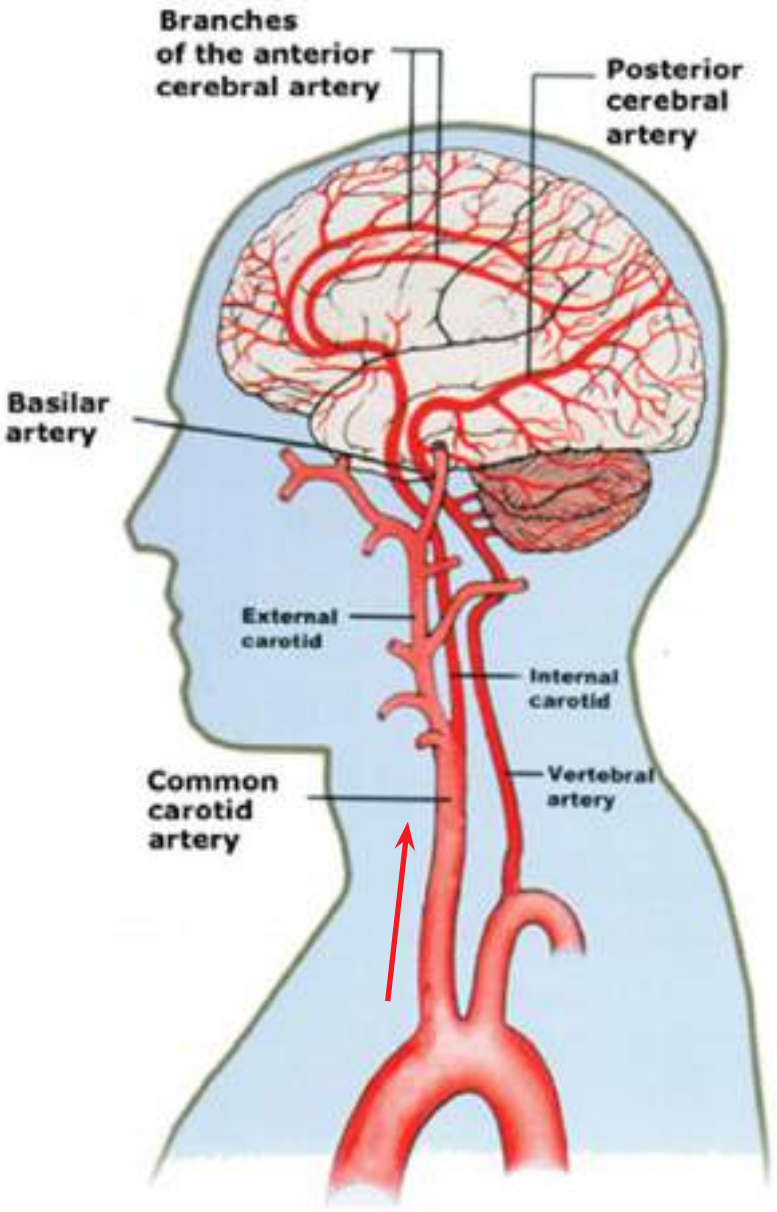
MAJOR BLOOD VESSELS OF THE BRAIN



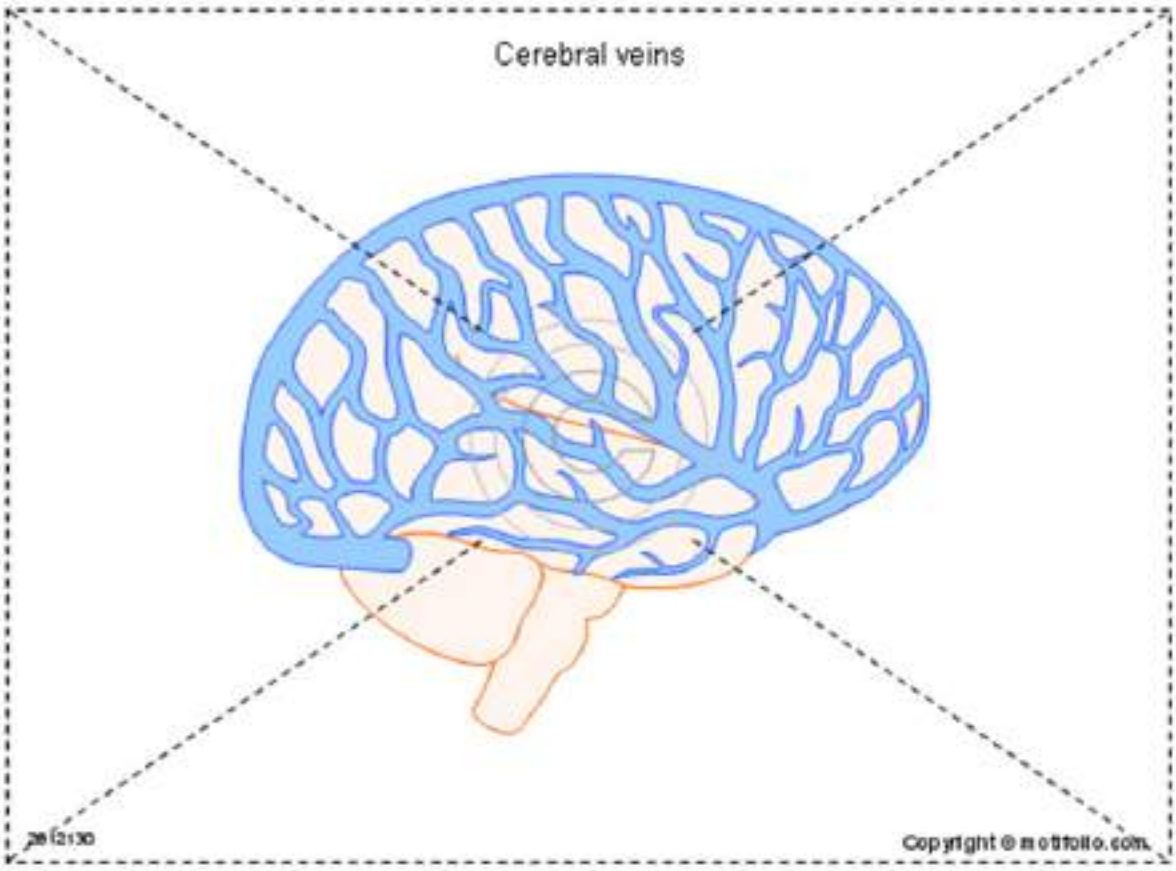
ARTERIES OF THE BRAIN



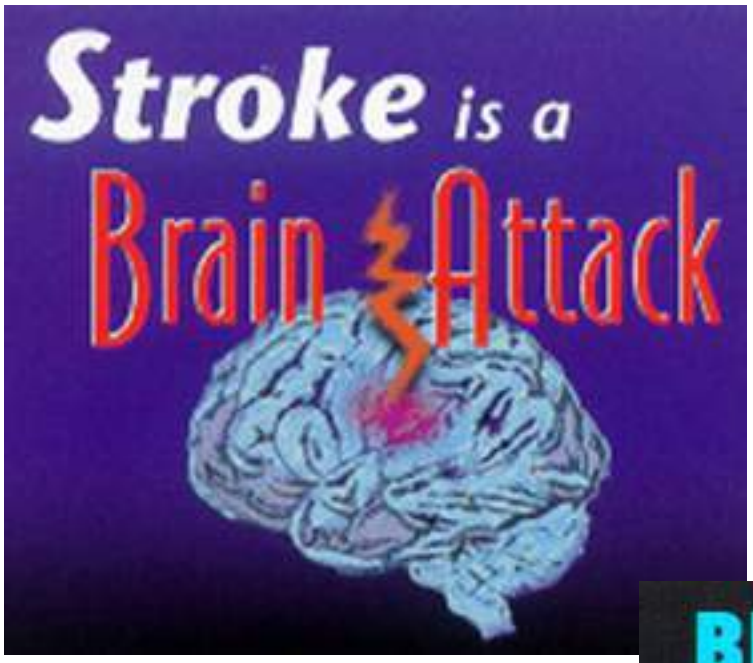
ARTERIES OF THE BRAIN

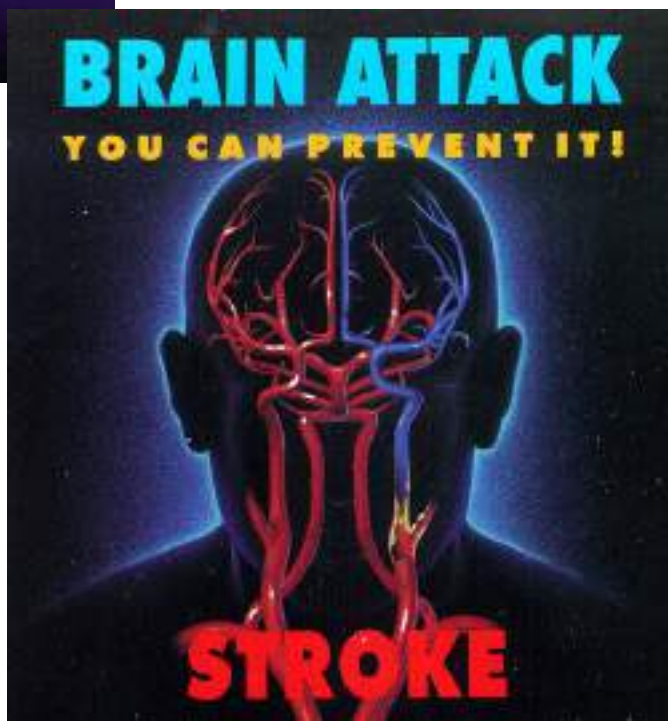


VEINS OF THE BRAIN



STROKE , LAKWA





WHAT IS A STROKE

Stroke happens suddenly

Affected area of brain stops working

Strokes are of 2 types:

1. Arterial
2. Venous

BURDEN OF STROKE IN INDIA

	1998	2004
No. of cases of stroke	792,628	930,985
No. of deaths	593,362	639,455
No. of life years lost	4,818,740	5,289,357
No. of disability adjusted	5,802,295	6,368,970

Govt. of India, Central Bureau of Health Intelligence, National Health Profile 2008. New Delhi: Directorate General of Health Sciences; 2008. p. 102

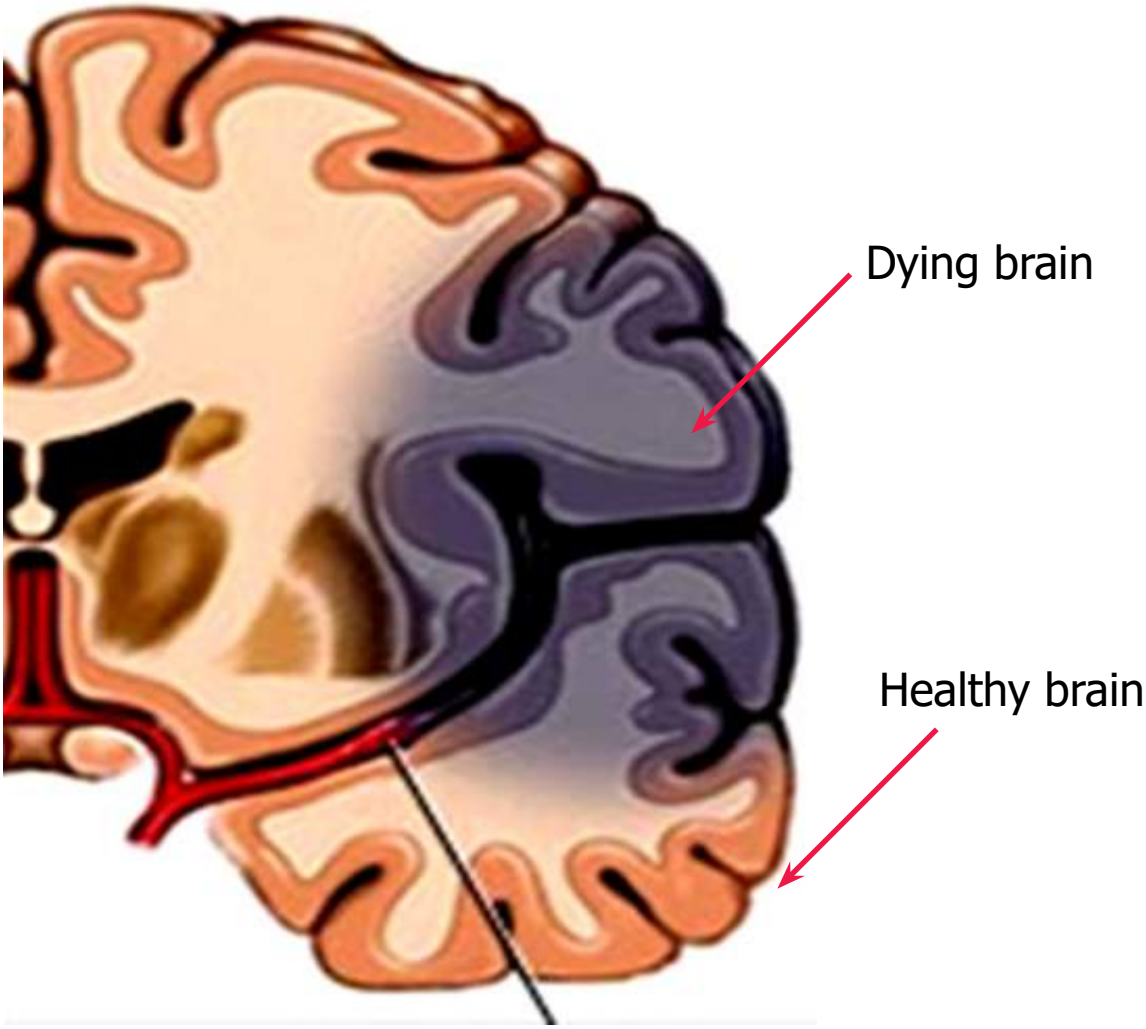
VENOUS STROKE

- Related to pregnancy and after delivery (particularly dehydration)
- Smoking particularly with oral contraceptive use
- We will focus on arterial ones

ARTERIAL STROKE: 2 TYPES

- Blockage type: a clot blocks flow of blood to the area supplied (ischaemic)
- Leakage type: blood leaks out of the artery (haemorrhagic)

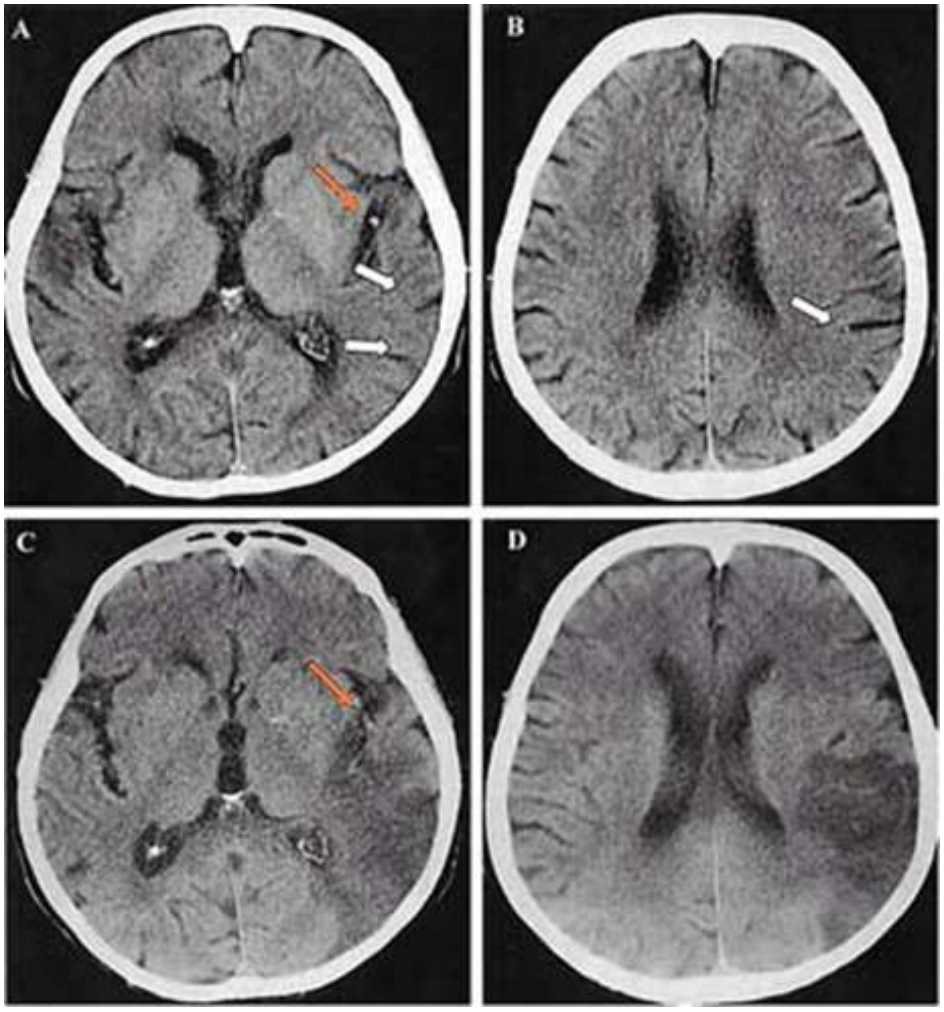
ISCHEMIC STROKE



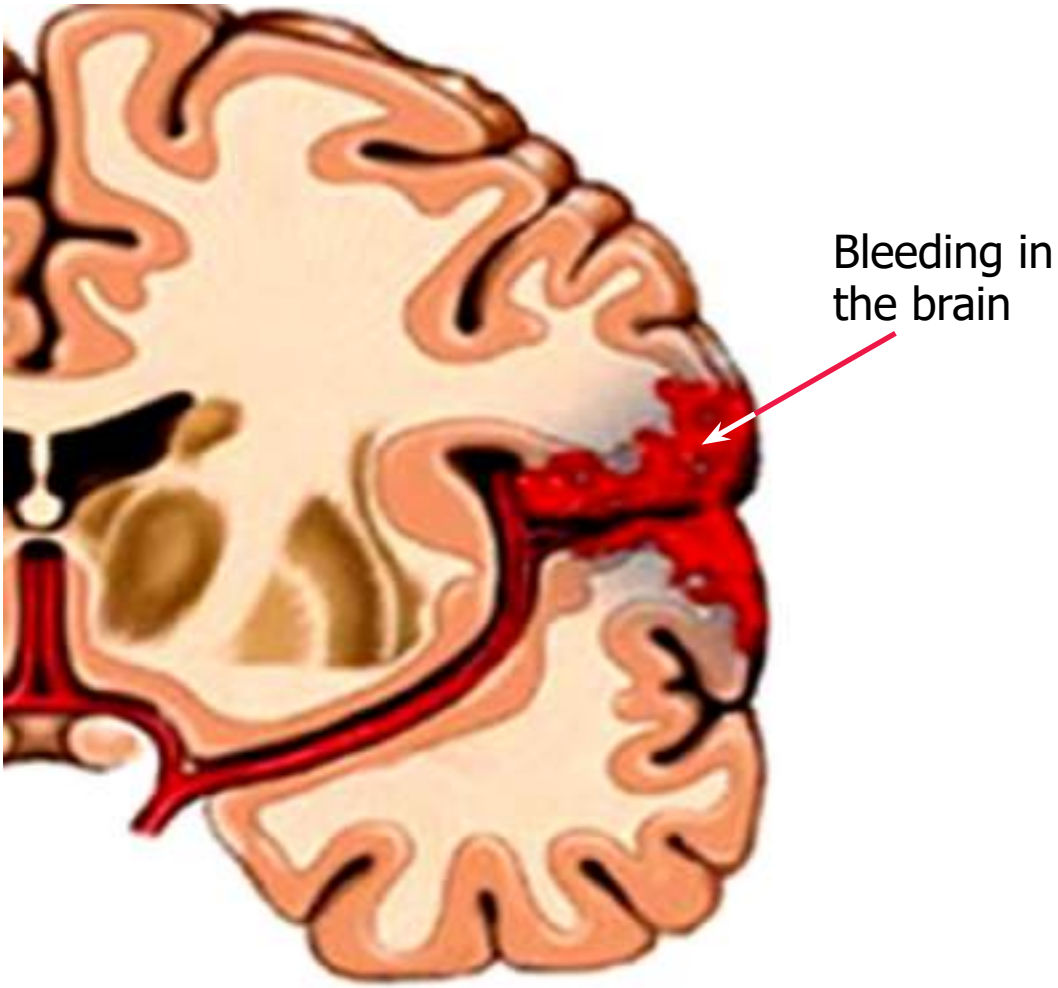
CLOT IN THE BLOOD VESSEL

URGENT CT SCAN

AN INFARCT

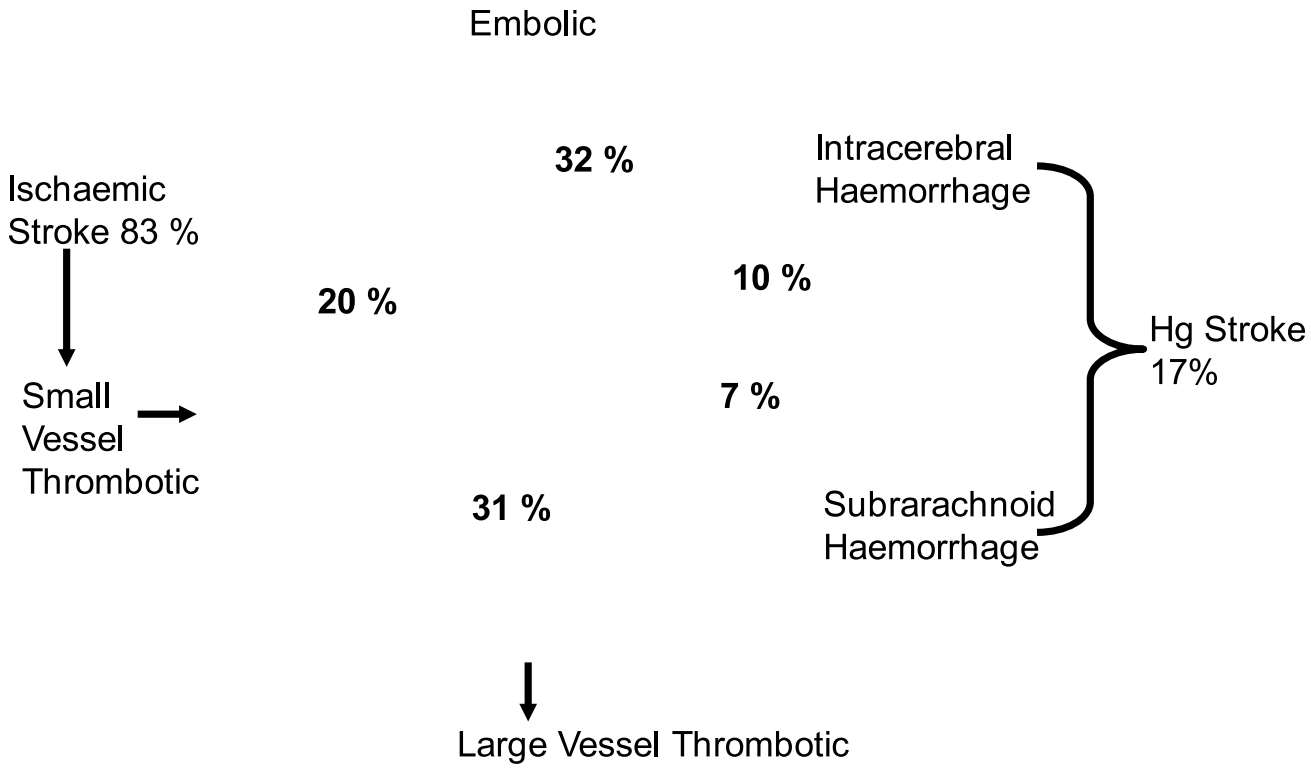


HEMORRHAGIC STROKE



CT SCAN - 2 DAY AFTER STROKE ONSET

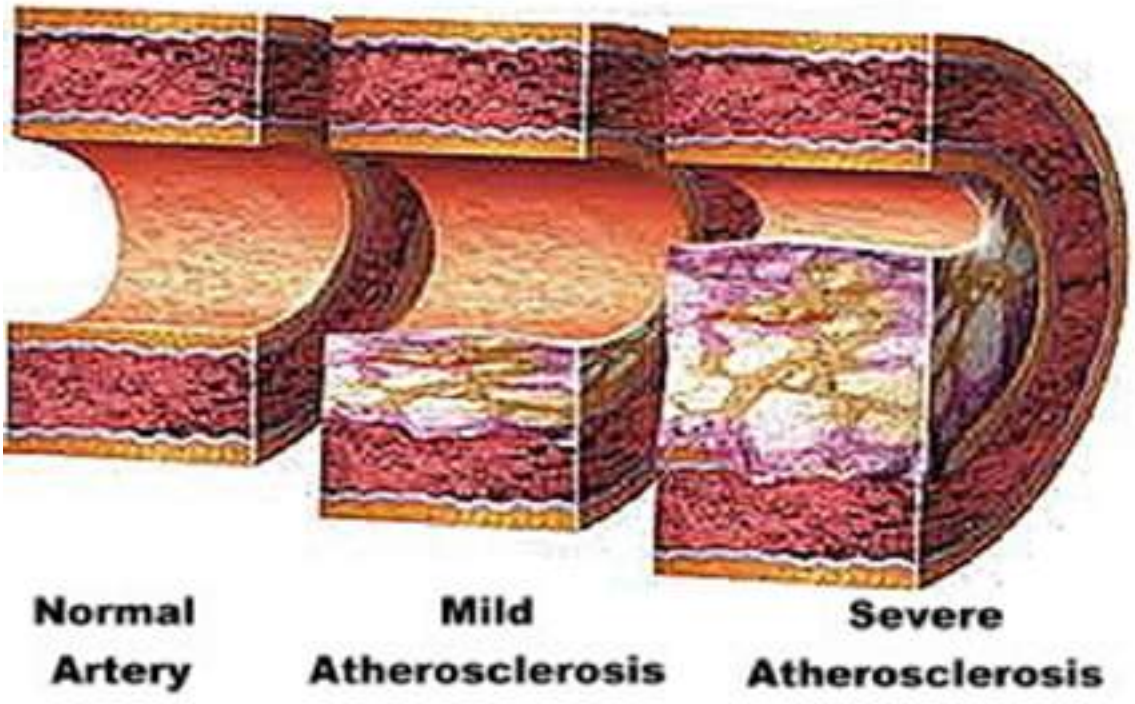
TYPES OF ARTERIAL STROKE



HOW ARE CLOTS FORMED

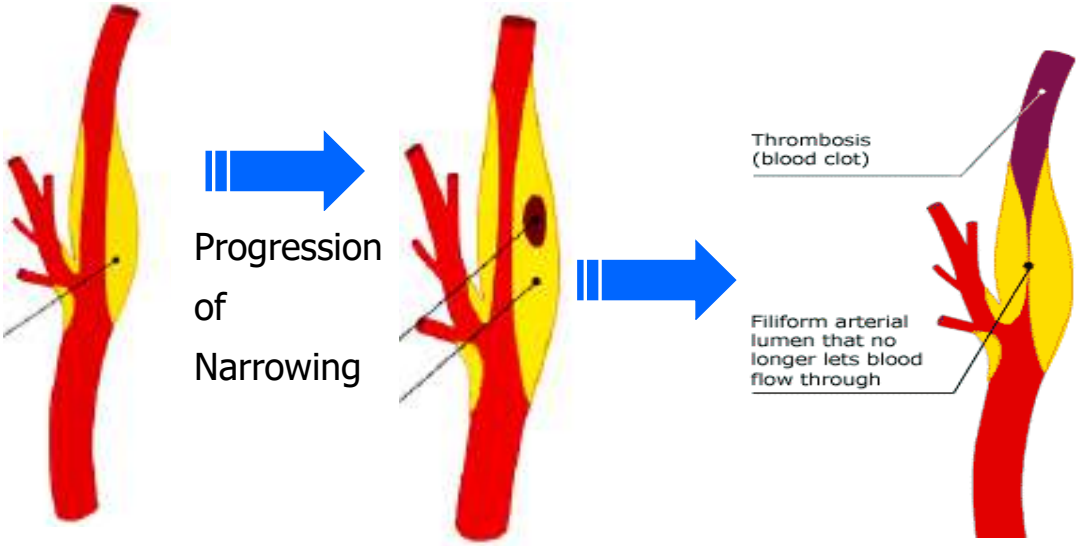
- Narrowing of blood vessel due to deposition of fat
- Narrowing of artery due to diabetes and hypertension
- Diseased heart throwing blood clots
- Some diseases that increase blood clot formation

ATHEROSCLEROSIS



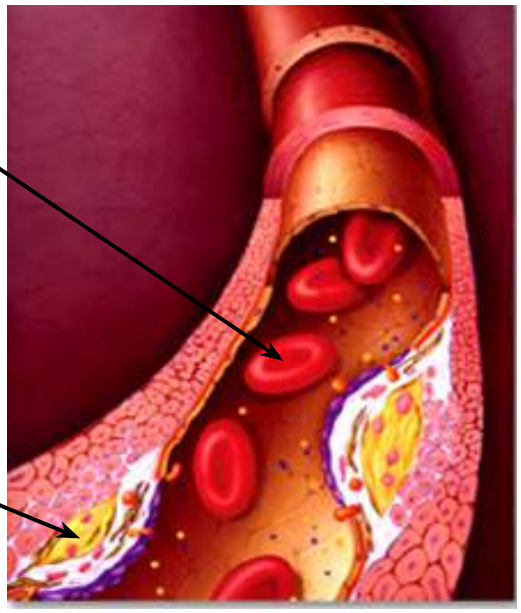
BLOOD VESSEL

Fat deposition in blood vessel

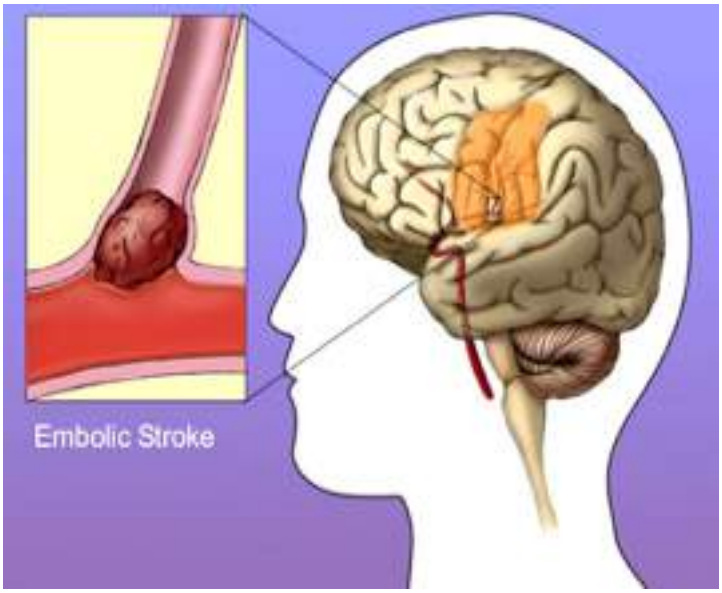


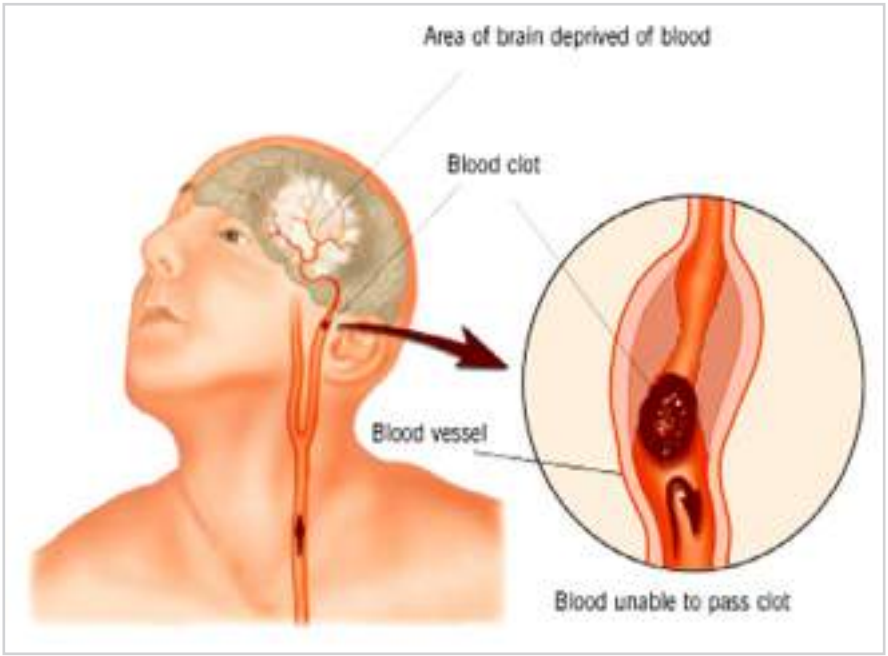
Flowing blood in the vessel

Deposited fat



DISEASED HEART THROWING CLOTS



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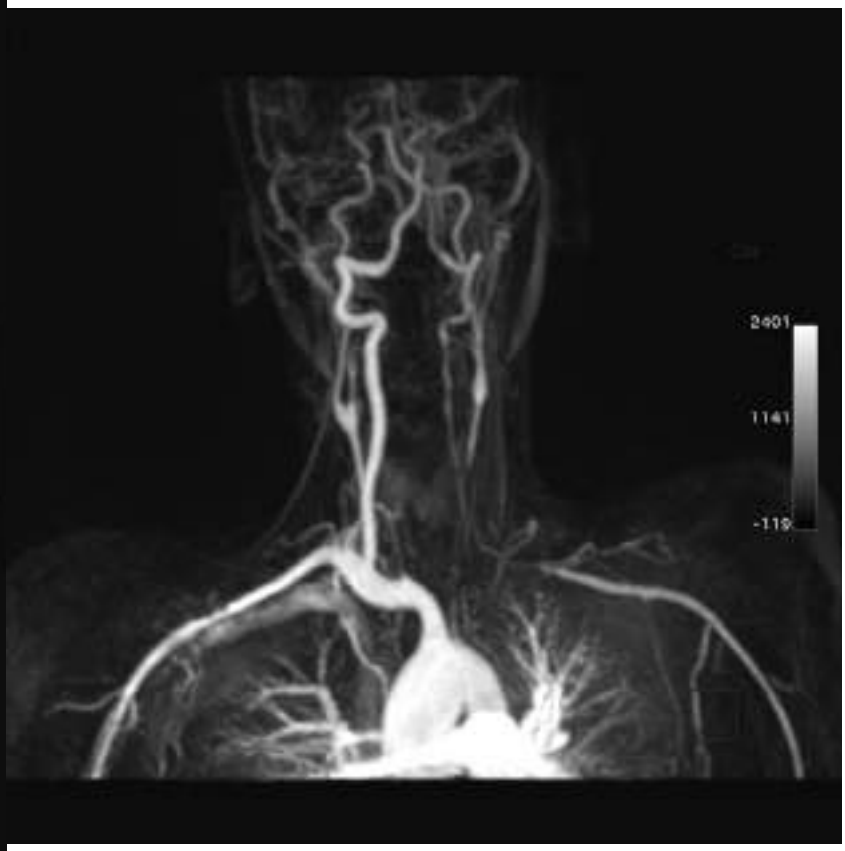
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WHAT ARE THE RISK FACTORS CAUSING STROKE

Hypertension

Smoking

Heart Disease

Over weight

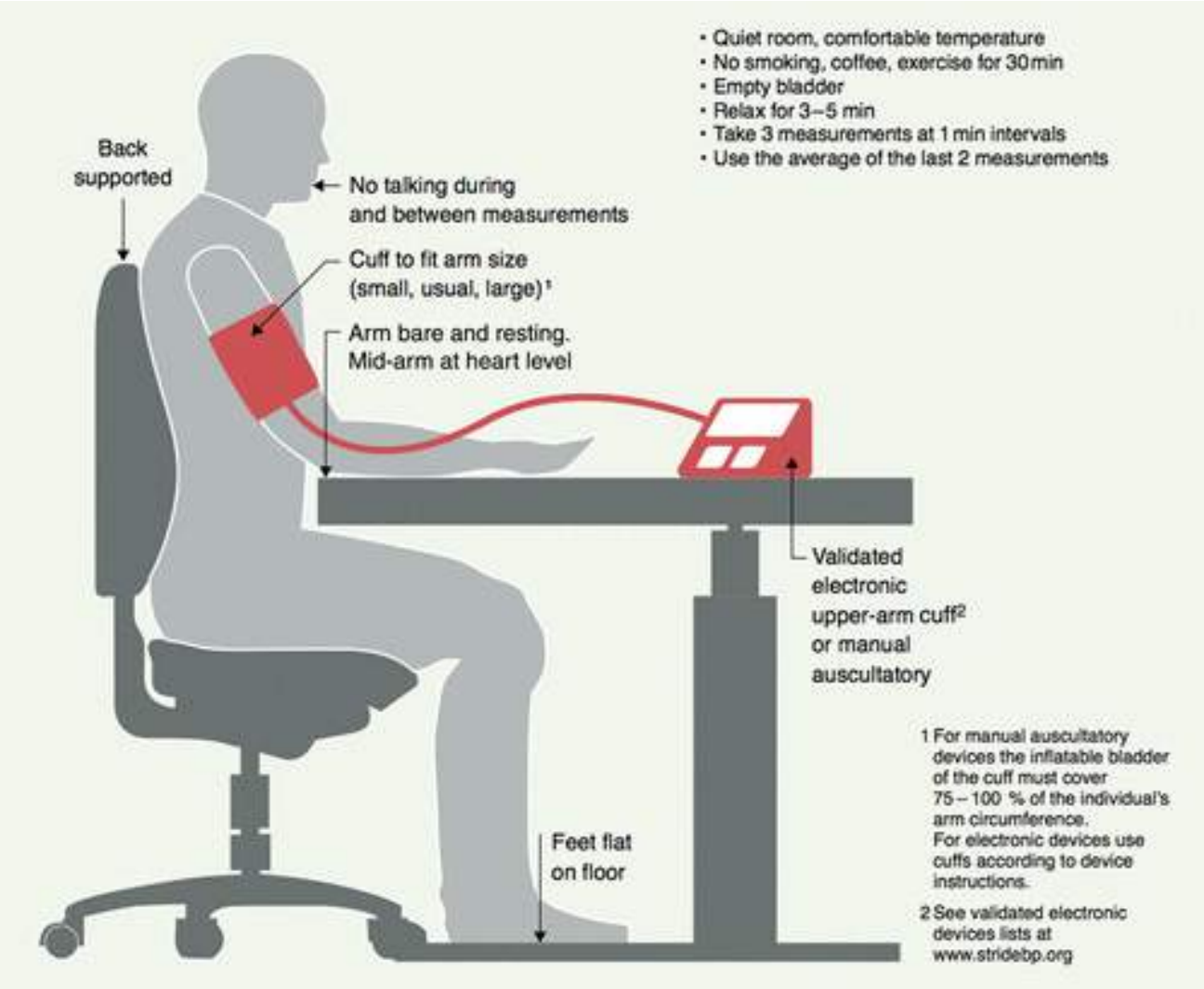
Unhealthy food habits

Table 1. Classification of Hypertension Based on Office Blood Pressure (BP) Measurement

Category	Systolic (mm Hg)		Diastolic (mm Hg)
Normal BP	<130	and	<85
High-normal BP	130–139	and/or	85–89
Grade 1 hypertension	140–159	and/or	90–99
Grade 2 hypertension	≥160	and/or	≥100

Hypertension Diagnosis – Office BP Measurement

- The measurement of BP in the office or clinic is most commonly the basis for hypertension diagnosis and follow-up. Office BP should be measured according to recommendations shown in Table 3 and Figure 1.[1,2,17,18]
- Whenever possible, the diagnosis should not be made on a single office visit. Usually 2–3 office visits at 1–4-week intervals (depending on the BP level) are required to confirm the diagnosis of hypertension. The diagnosis might be made on a single visit, if BP is ≥180/110 mm Hg and there is evidence of cardiovascular disease (CVD).[1,2,17,18]



omas Unger. Hypertension. 2020 International Society of Hypertension Global Hypertension Practice Guidelines, Volume: 75, Issue: 6, Pages: 1334-1357, DOI: (10.1161/HYPERTENSIONAHA.120.15026)

	HOME BP MEASUREMENT	24-HOUR BP MONITORING
Measurement protocol	Before each visit to the health professional: • 3–7-day monitoring in the morning (before drug intake if treated) and the evening. • Two measurements on each occasion after 5 min sitting rest and 1 min between measurements. Long-term follow-up of treated hypertension: • 1–2 measurements per week or month.	• 24-hour monitoring at 15–30 min intervals during daytime and nighttime. • At least 20 valid daytime and 7 nighttime BP readings are required. If less, the test should be repeated.
Interpretation	• Average home blood pressure after excluding readings of the first day ≥135 or 85 mm Hg indicates hypertension.	• 24-hour ambulatory blood pressure ≥130/80 mm Hg indicates hypertension (primary criterion). • Daytime (awake) ambulatory blood pressure ≥135/85 mm Hg and nighttime (asleep) ≥120/70 mm Hg indicates hypertension

WHITE COAT AND MASKED HYPERTENSION

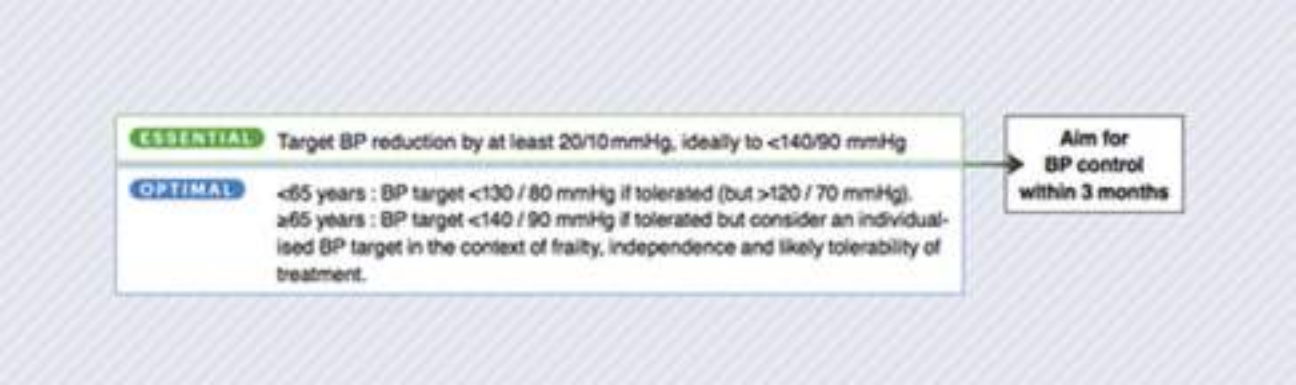
White coat HTN: Elevated BP in clinic but not at home or on 24-hour monitoring: 10-30%

If no organ damage: only lifestyle modification

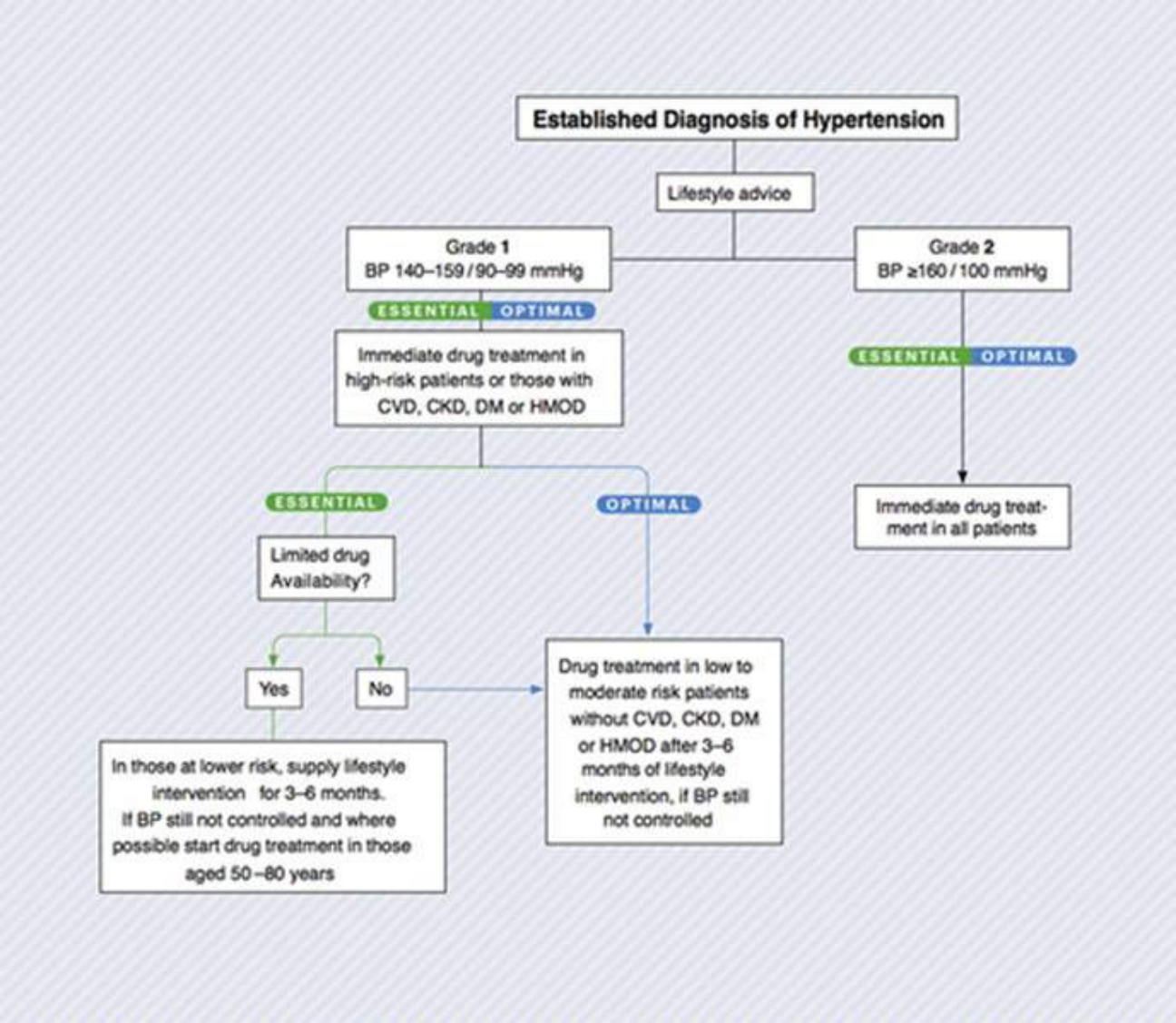
Masked HTN: Normal BP in clinic but elevated at home or on 24-hour monitoring: 10-15%

Confirm with repeated measurements
May need medicines

Office Blood Pressure Levels (mm Hg)		
<130/85	130–159/85–99	>160/100
Remeasure within 3 years (1 year in those with other risk factors)	If possible confirm with out-of-office blood pressure measurement (high possibility of white coat or masked hypertension). Alternatively confirm with repeated office visits.	Confirm within a few days or weeks

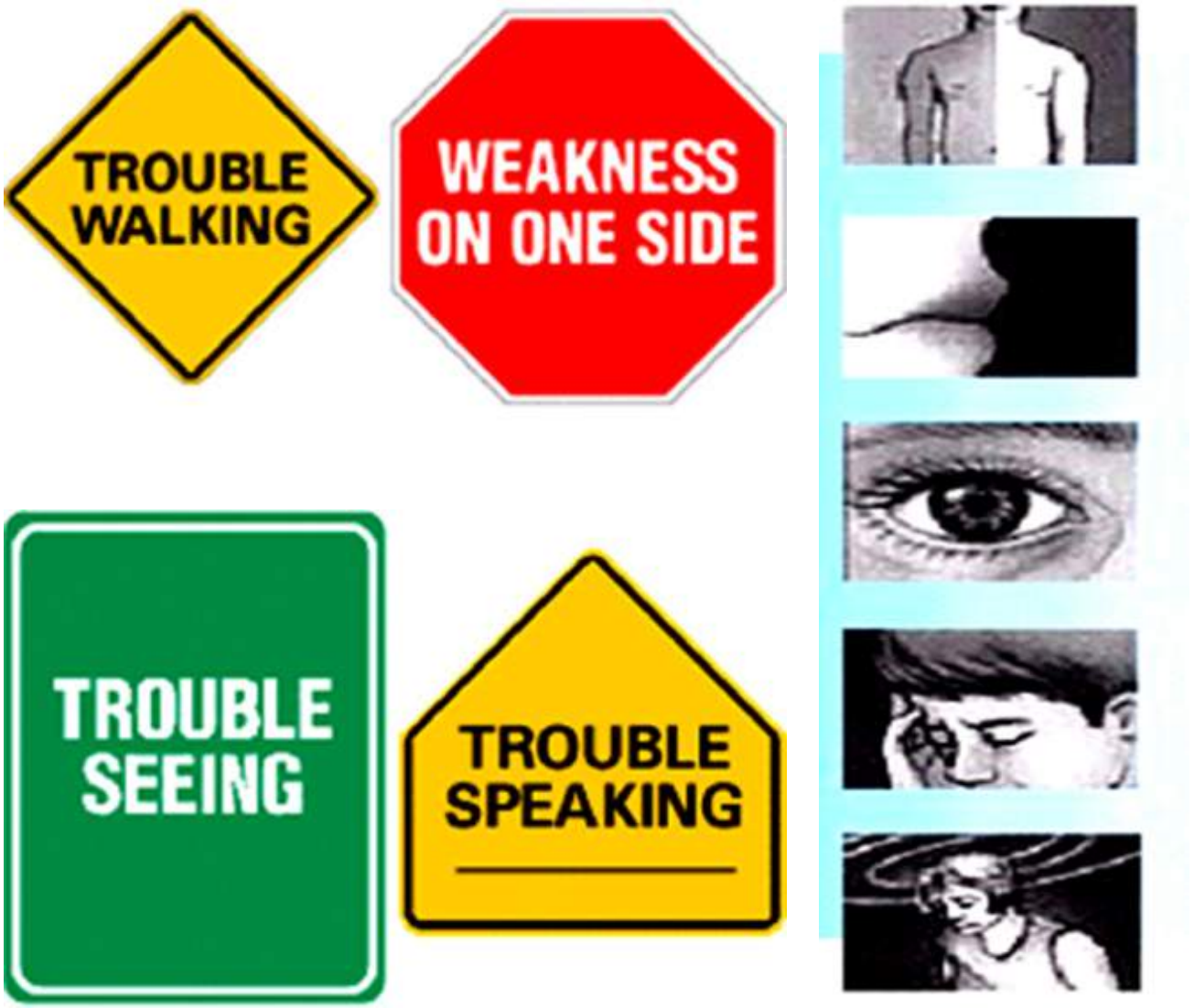


omas Unger. Hypertension. 2020 International Society of Hypertension Global Hypertension Practice Guidelines, Volume: 75, Issue: 6, Pages: 1334-1357, DOI: (10.1161/HYPERTENSIONAHA.120.15026)

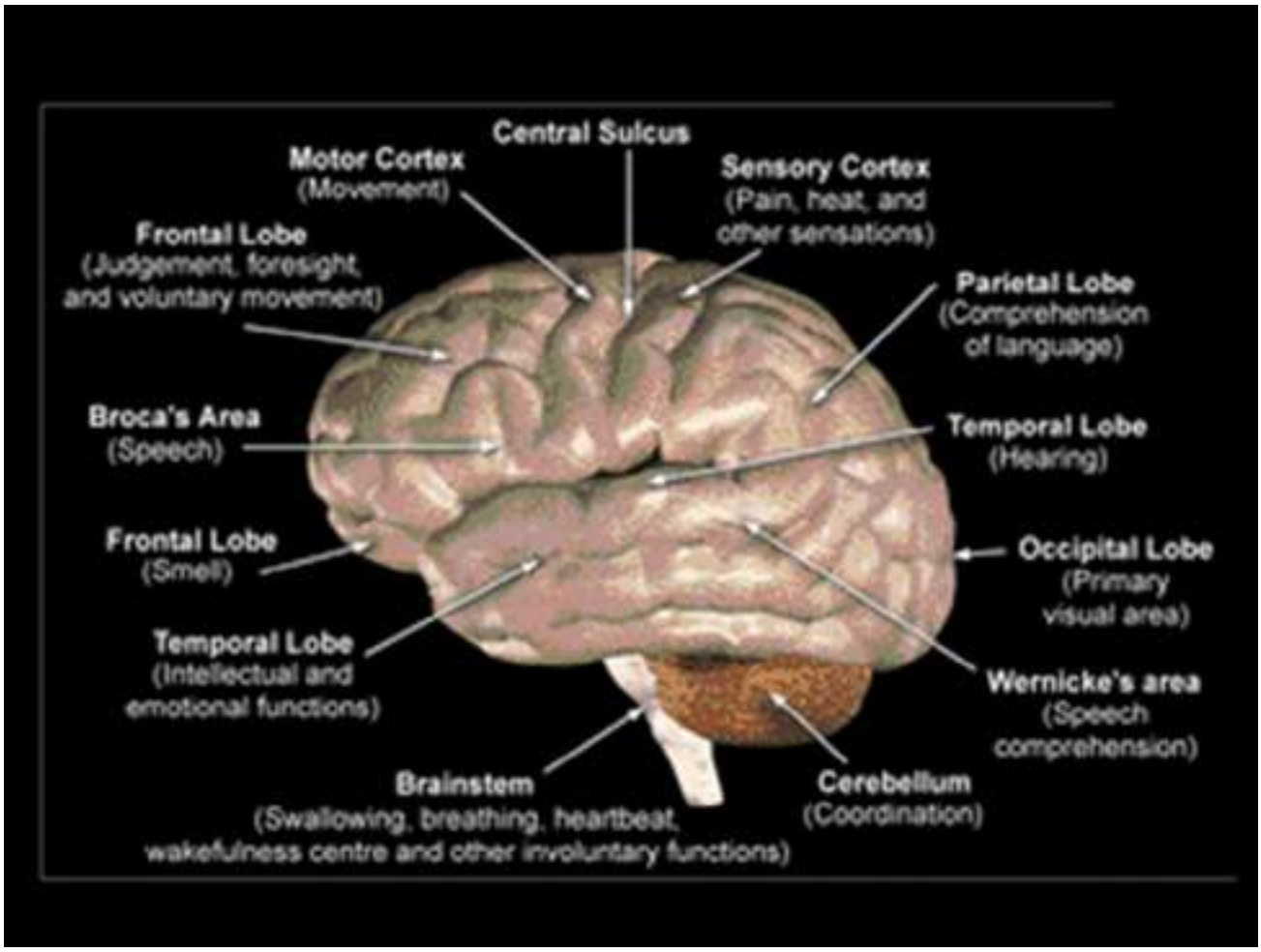


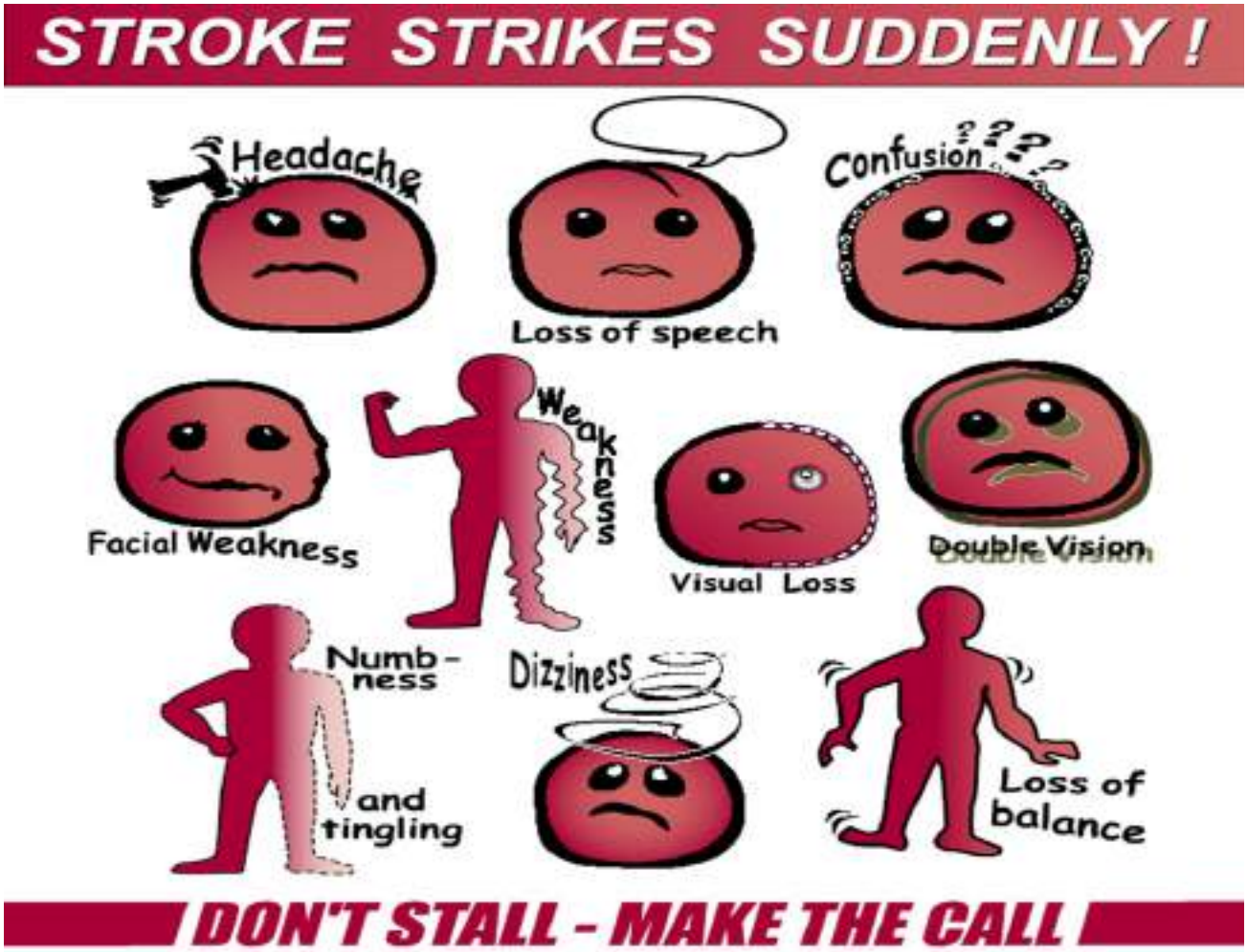
omas Unger. Hypertension. 2020 International Society of Hypertension Global Hypertension Practice Guidelines, Volume: 75, Issue: 6, Pages: 1334-1357, DOI: (10.1161/HYPERTENSIONAHA.120.15026)

WHAT ARE THE SYMPTOMS OF STROKE



CONTROL CENTRES OF THE BRAIN & THEIR DIFFERENTIATED FUNCTIONS




STROKE STRIKES SUDDENLY !
Headache
Loss of speech
Confusion
Facial Weakness
Weakness
Visual Loss
Double Vision
Numb-ness
and tingling
Dizziness
Loss of balance
DON'T STALL - MAKE THE CALL

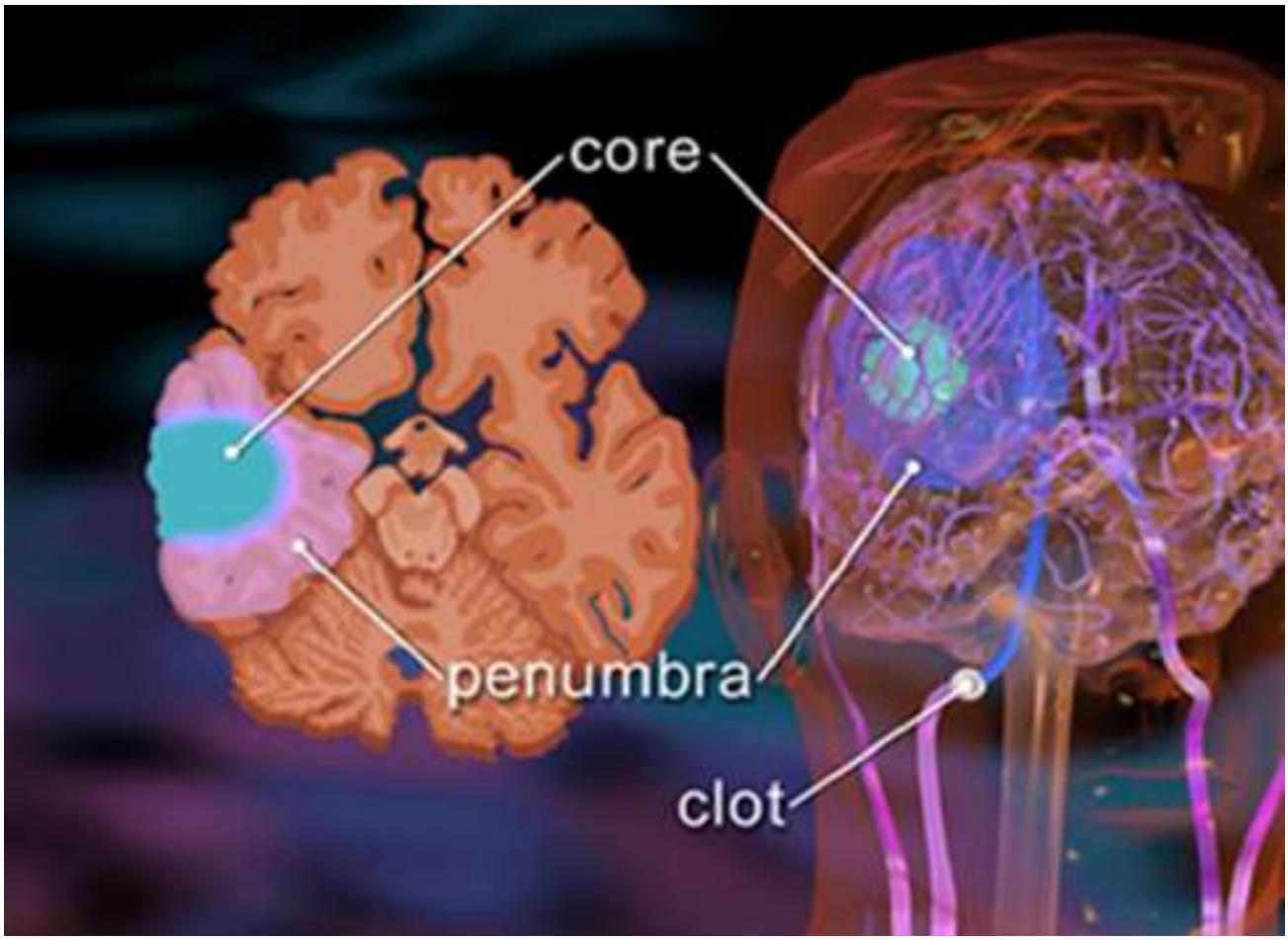
WARNING SIGNS OF STROKE

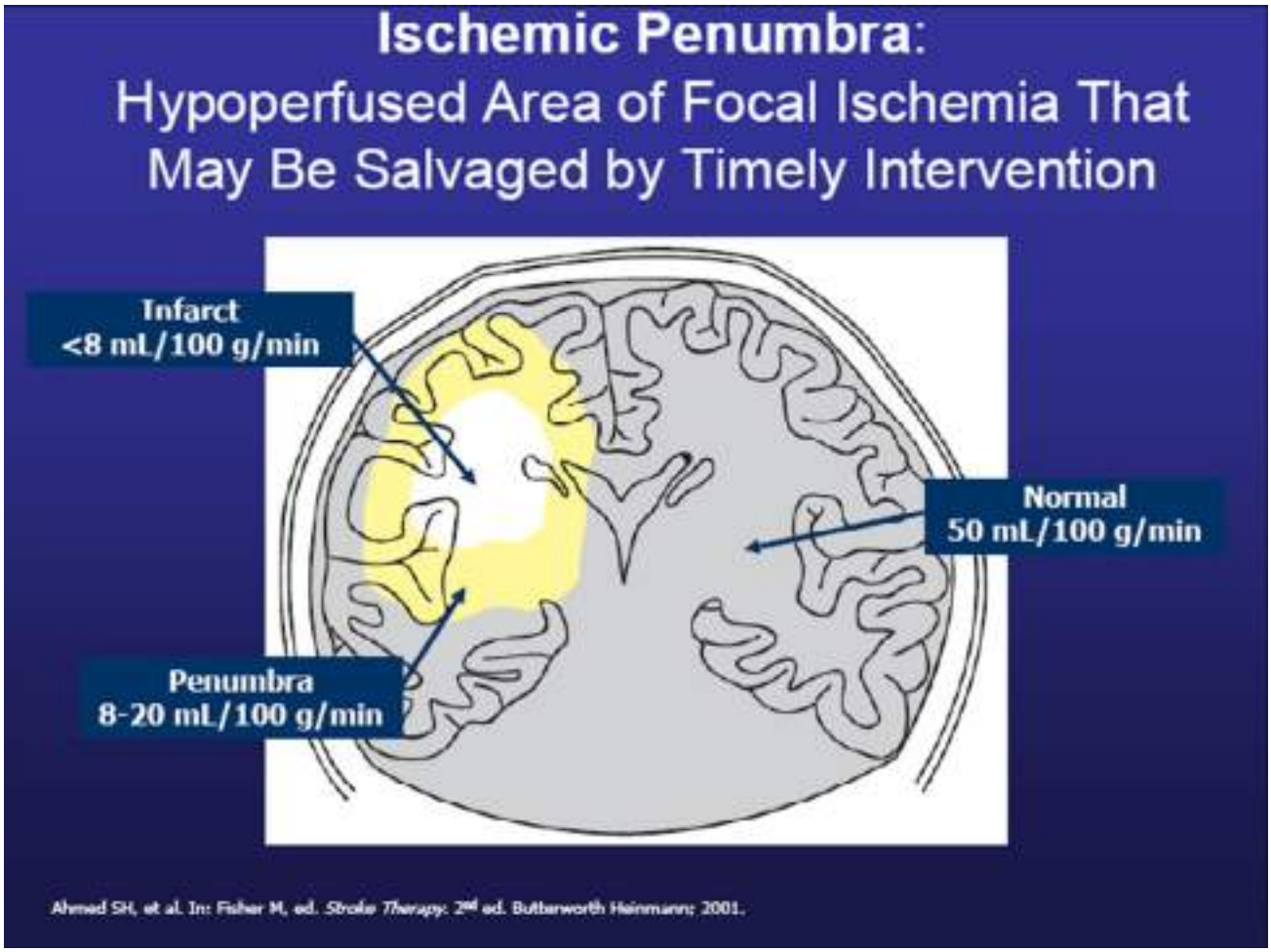
- Sudden weakness, paralysis or numbness of the face, arm & leg on one or both sides of the body.
- Loss or speech, or difficulty speaking or understanding speech.
- Dimness or loss of vision, particularly in only one eye.

- Unexplained unsteadiness, and double vision.
- Sudden severe headache never experienced before.

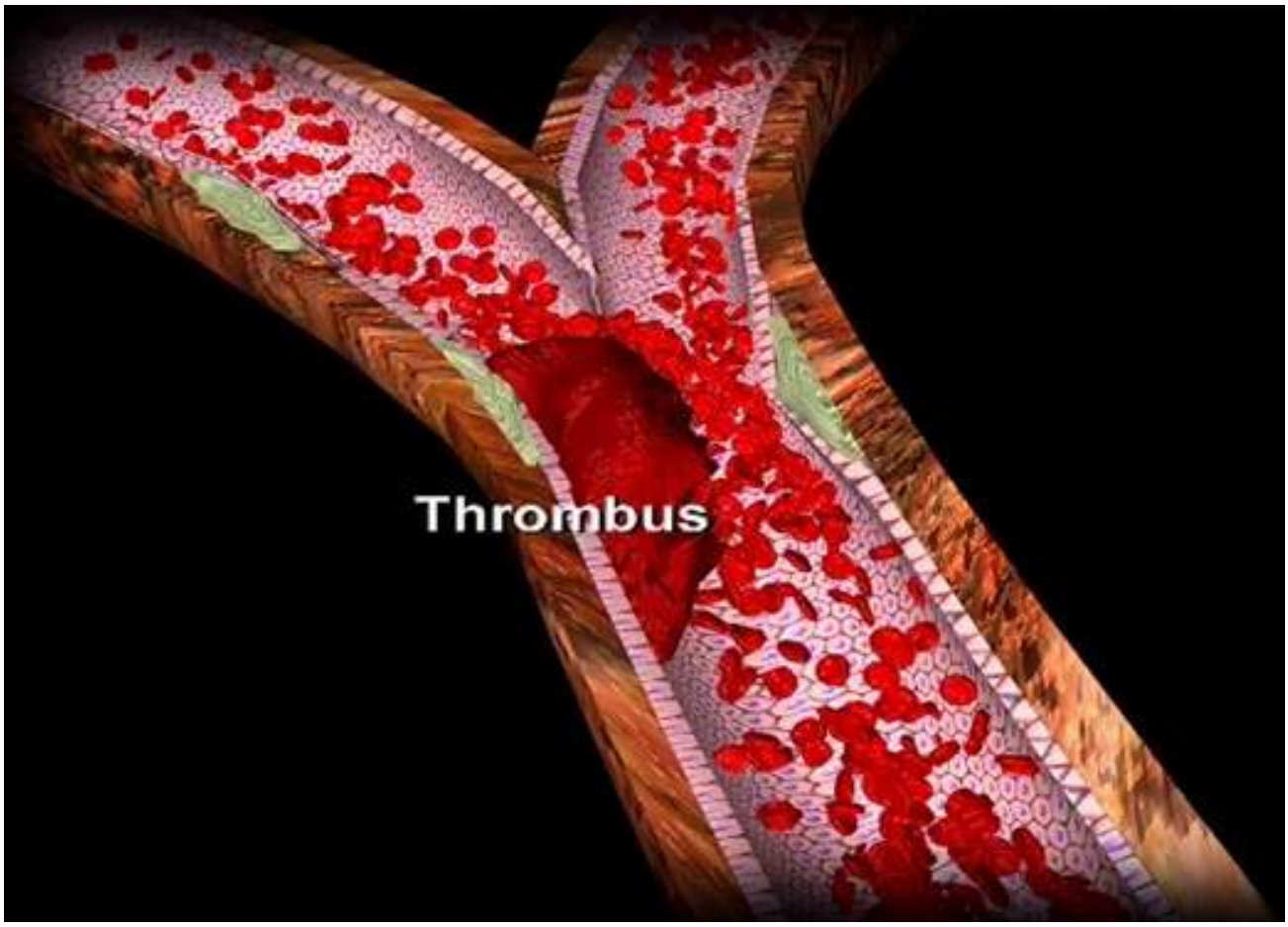
TREATMENT OF STROKE

PENUMBRA




Ischemic Penumbra:
Hypoperfused Area of Focal Ischemia That May Be Salvaged by Timely Intervention
Infarct
<8 mL/100 g/min
Normal
50 mL/100 g/min
Penumbra
8-20 mL/100 g/min
Ahmed SH, et al. In: Fisher M, ed. Stroke Therapy. 2nd ed. Butterworth Heinmann; 2001.

CEREBRAL EMBOLISM (FORMATION)



URGENT INVESTIGATION IN STROKE: CT SCAN

RISK FACTORS FOR STROKE - TREATABLE

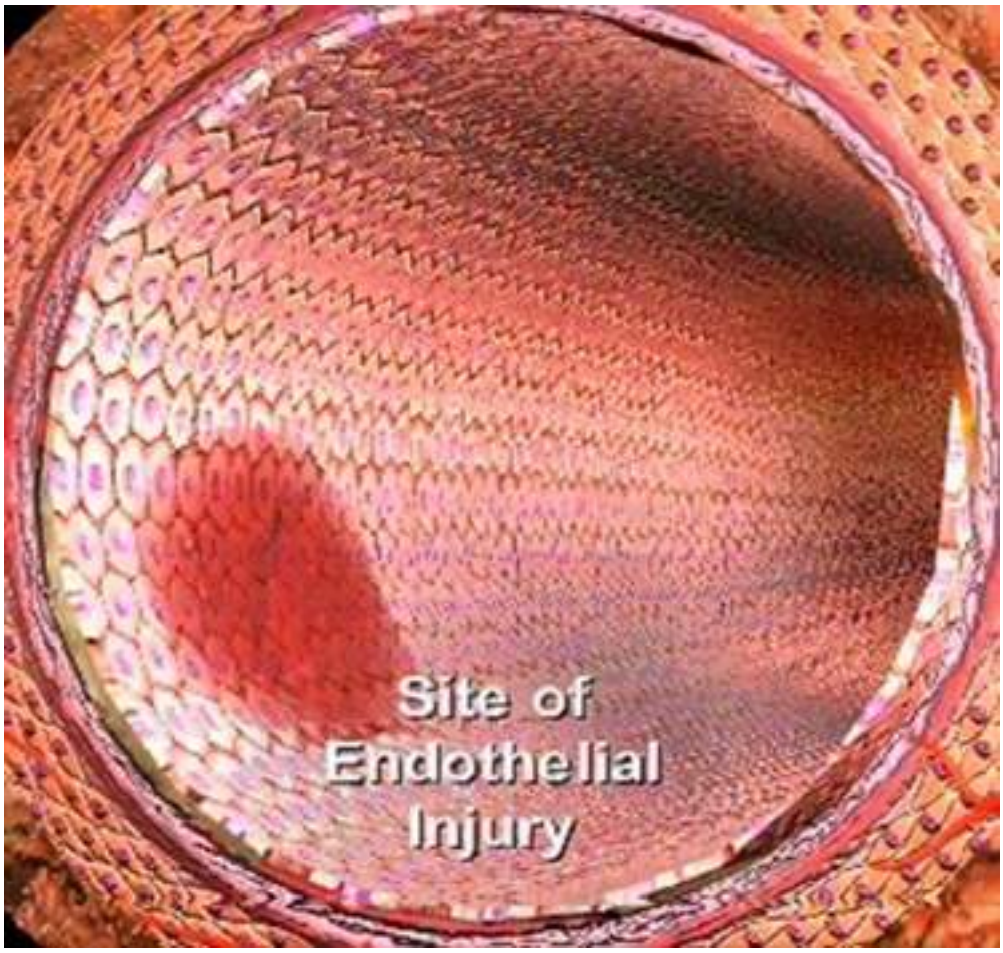
Major:

- Hypertension
- Diabetes
- High cholesterol
- Heart Disease, esp. atrial fibrillation.
- Cigarette Smoking.
- Transient Ischaemic Attacks.

SECONDARY

- Increased Serum Cholesterol / Lipids.
- Physical Inactivity.
- Obesity.

ATHEROSCLEROSIS & THROMBOSIS

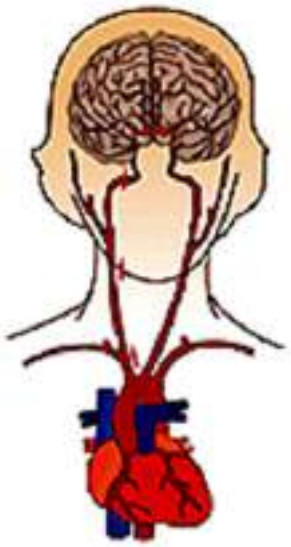


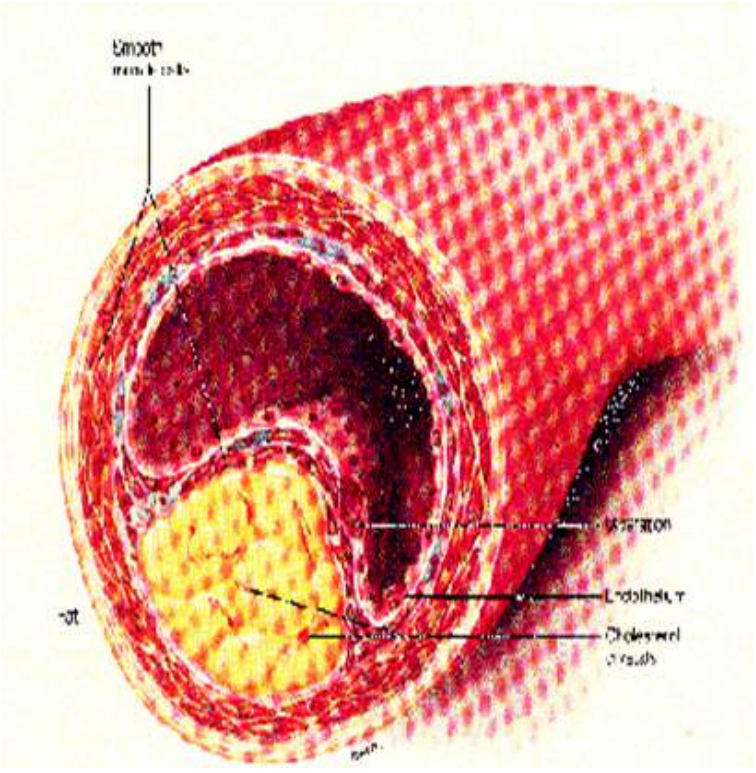
STROKE ALWAYS STUNS

- Stroke strikes unexpectedly.
- Stroke does not discriminate.

..IF THERE IS A STROKE, HURRY UP...!

CLOT DISSOLVING OR CLOT REMOVAL





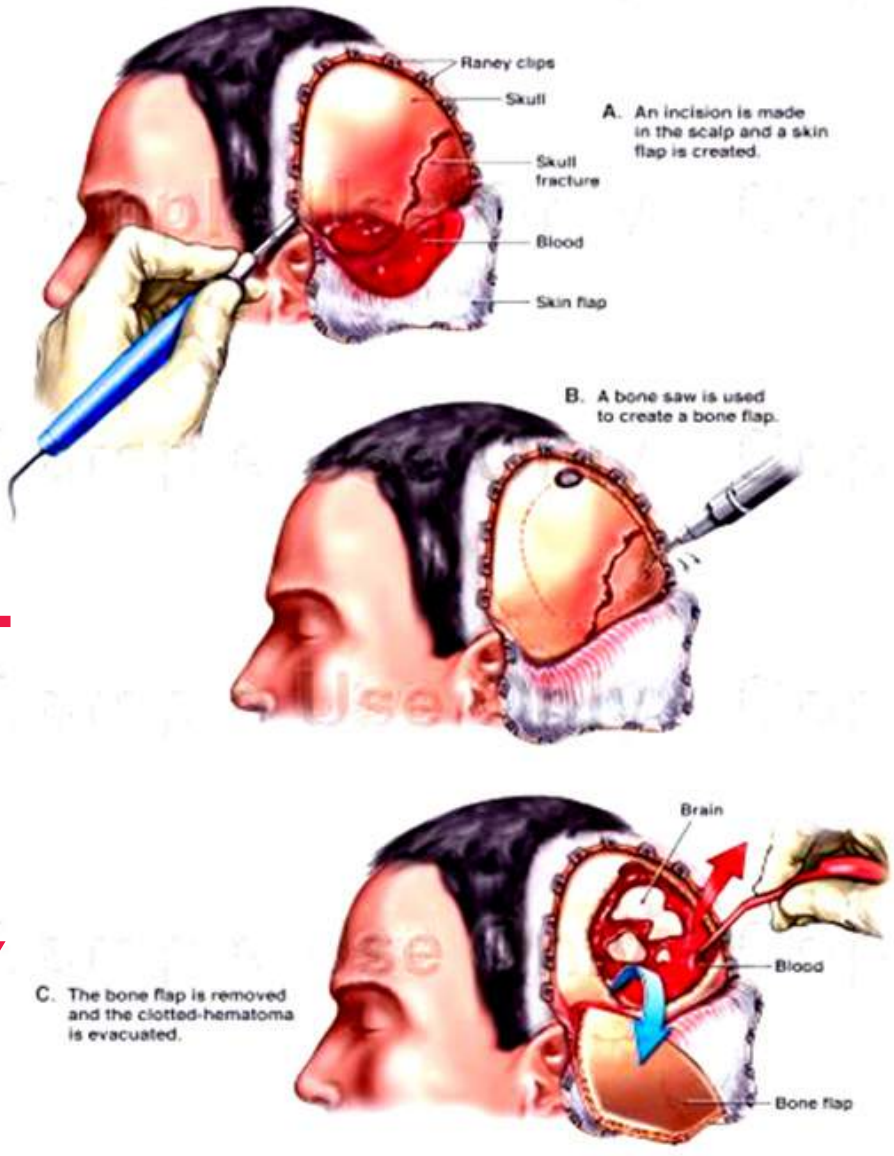
HEMORRHAGIC STROKE

- Requires urgent treatment
- In some patients surgery is done to remove the bleeding related clot.

BLEED

REMOVAL

SURGERY



SUPPORTIVE CARE OF PATIENTS

NUTRITION

EXERCISE AND REHABILITATION

CONCLUSION 1.

TIME IS
IMPORTANT

CONCLUSION 2

DO NOT WASTE TIME AFTER A STROKE

CONCLUSION 3

- LEARN TO RECOGNISE STROKE
- REACT TO STROKE ON TIME

...A HAPPY ENDING...

- Stroke need not necessarily disable.
- Stroke need not necessarily kill.

Life Style & Diet for Stroke Prevention

Dr. M V Padma Srivastava, the third and last speaker of the webinar talked about "Life Style and Diet for Stroke Prevention". She classi ed the risk factors of the stroke into two categories viz., Modi able and Non-Modi able. Hypertension is the most important modi able risk factor for stroke followed by Diabetes, Cardiac diseases, Atrial brillation, TIA/Prior stroke, Dyslipidemia, Cigarette smoking, Alcohol abuse, Obesity, Physical inactivity, Carotid stenosis, and Sleep apnea. Whereas, Age, Gender, Race/ethnicity, and Heredity were among the non-modi able risk factors. She enumerated further details of both Non-modi able and modi able risk factors.

Dr. Padma laid a lot of emphasis on LifeStyle factors and said a healthy lifestyle comprising eating su cient fruits and vegetables, exercising, and maintaining a BMI<25, can bring about a 90 % reduction in the risk of stroke. She advised strictly against smoking and consumption of alcohol. She said that ve healthy lifestyle choices such as not smoking, no alcohol, maintaining a BMI<25, daily exercise of > 30 minutes, and healthy diet together might lead to an 80 % reduction of stroke compared with people who have none. Further, moderate to vigorous physical activity for primary stroke prevention leads to decreased blood pressure, decreased LDL cholesterol, and weight loss. It also leads to increased glucose uptake and insulin sensitivity in people with and without diabetes. For people with stroke, exercise and training can improve hypertension, lipid pro les, glucose metabolism, and insulin sensitivity, improved balance, gait speed, and endurance, and decreased disability.

Talking about diet, she explained how the consumption of harmful diet has increased the world over including in the US and China. She noticed that between 2003 and 2013, stroke mortality per 100,000 in urban people increased by 26.6%, and coronary mortality increased by 213%. Explaining the trends in dietary guidelines, she said, plant-based diets are encouraged more. According to **Dietary Approaches to Stop Hypertension (DASH),** fruits, vegetables, and low-fat dairy foods with reduced intake of saturated fat, total fat, and cholesterol; inclusion of whole grains, poultry sh, and nuts; reduction in red meat, sweets, and sugar-containing beverages are recommended. e **Mediterranean diet** also emphasizes whole grains, fruits, vegetables but it is high in bene cial oils (olive and canola) low in dairy products, and contains much less animal esh. She discussed the bene cial evidence of consuming a Mediterranean diet.

e bene cial e ects of Tea and Co ee were explained by Dr. Padma. According to available evidence, consuming 3-5 cups per day of co ee reduces cardiovascular risk. Both green tea and other forms of tea reduce cardiovascular risk. Green tea lowers blood pressure and LDL cholesterol and improves endothelial function.

Dealing with dietary intake of Sodium, Dr. Padma mentioned the **International Study of Salt and Blood Pressure (INTERSALT)** and the Dietary Approach to Stop Hypertension Trial (DASH) both had shown a signi cant inverse relationship between salt intake and both systolic and diastolic blood pressure. A meta-analysis of large prospective studies revealed that higher salt intake is associated with a signi cantly greater incidence of strokes and total cardiovascular events, with a dose-dependent association.

For prevention of atherosclerosis (fat deposition), promoting vascular relaxation and antihypertensive

properties, consumption of avonoids found in fruits, vegetables, and beverages, including apples, berries, grapes, onions, tea, cocoa, and dark chocolate is recommended. e highest levels of chocolate consumption were associated with a reduction in cardiovascular disease and stroke.

Dr. Padma explained the bene cial role of certain fats. e major food sources of n-3-polyunsaturated fatty acids (Omega-3 Fatty Acids) are deep and cold-water sh such as salmon, trout, and cod. Oils of many species of marine sh are rich in **eicosapentaenoic acid EPA and docosahexaenoic acid DHA**. Diet and Reinfarction Trial (DART) and GISSI, an Italian trial showed clear bene ts of n-3-polyunsaturated fatty acids in reducing total mortality and sudden death. Alpha-linolenic acid suggests a reduction of 35 to 50% in the risk of stroke with increasing its intake. Its main sources are vegetable oils such as soybean, canola, axseed, and walnuts. Replacing saturated fat with polyunsaturated or monosaturated fat can reduce both HDL and LDL cholesterol. Adoption of the Mediterranean diet, which encompasses the increased alpha-linolenic acid intake a reduction in saturated fat, and a modest increase in ber was associated with a 72% reduction in recurrent coronary heart events in patients with prior MI.

Describing the intake of carbohydrates, she said So drink consumption is playing a role in the epidemics of insulin resistance, obesity, hypertension, stroke, dyslipidemia and type 2 DM in humans. Increased risk of stroke mortality is associated not only with a high intake of carbohydrates but also with the dietary glycemic index (GI) and glycemic load (GL). Increased ber intake reduces blood pressure, blood glucose, serum triglycerides, and LDL cholesterol.

She gave dietary recommendations for patients “At Risk of Stroke” as listed below:

(a) No egg yolks: use egg whites, egg beaters, egg creations, or similar substitutes.

(b) e esh of any animal: a serving the size of the palm or less, ~every other days (or half that daily).

(c) Seldom red meat, mainly sh and chicken.

(d) High intake of olive oil and canola oil.

(e) Only whole grains.

(f) High intake of vegetables, fruit, and legumes.

(g) Avoid deep-fried foods and hydrogenated oils (trans fats).

(h) Avoid sugar and re ned grains, and limit potatoes.

Continuing with behavioral risk factors, she said smoking is an independent risk factor for stroke. e risk of rst ischemic stroke in smokers is nearly four times the risk of non-smokers. It increases stroke risk by contributing to the acceleration of atherosclerosis. If one gets rid of smoking, the bene ts are immediate. So, stop smoking to bring down the risk of stroke by more than 50 %. Similarly, stop taking alcohol to avoid the risk of hemorrhagic and ischemic stroke.

Dr. Padma gave the following important recommendations as take-home messages:

Lowering blood pressure

(a) Maintain a blood pressure level not more than 120/80 mm Hg

(b) Reduce salt in your diet. Ideally not more than half a teaspoon per day.

(c) More polyunsaturated and monounsaturated fats in the diet and avoid saturated fats.

(d) Four to ve cups of fruits and vegetables per day; one serving of sh two to three times a week and several daily servings of whole grains and low-fat dairy.

(e) Get more exercise – at least 30 minutes of activity per day.

(f) Quit smoking

Lose weight

(a) Achieve BMI ≤ 25 kg/m^2.

(b) Try to eat no more than 1500 - 2000 calories per day.

(c) Increase the amount of exercise you do like walking, playing, or making activity a part of every single day.

Obesity

(a) Abdominal girth should be ≤ 40 inches in men and ≤ 35 inches in women.

(b) Promoting weight loss & maintenance of a healthy weight to be given high priority.

Exercise

(a) Exercise at a moderate intensity at least ve days a week.

(b) Take a walk around your neighborhood every day.

(c) Start a tness club with friends.

(d) When you exercise, reach a level at which you are breathing hard but you can still talk.

(e) Take the stairs instead of the elevator.

(f) If you don't have a consecutive 30 minutes to exercise, break it up into 10 or 15-minute sessions a few times a day.

e recommendations for "**Physical Activity after Stroke**" as described by Dr. Padma are given below:

Important considerations

(a) A health care professional should supervise the initiation of a physical activity program.

(b) Individuals at risk for cardiovascular events should undergo cardiac stress testing.

(c) Heart rate and perceived exertion should be regularly monitored during physical activity.

Aerobic activity

(a) Duration and frequency: 20- 60 minute sessions, 3-5 d/wk.

(b) Target: 55%-80% of maximum heart rate or perceived exertion of “light” to “somewhat hard”.

(c) Multiple short sessions (eg,10 minutes) to build tolerance and endurance are encouraged.

Strength training

(a) Amount and frequency: 1-3 sets of 10-15 repetitions targeting large muscle groups, 2-3 d/wk.

(b) Target: 50%-80% of one-repetition maximum.

Non-exercise physical activity

Reduce sedentary time by standing and walking more o en.

Examples: stand during tasks that could be completed sitting, reduce time viewing television, go for more frequent walks, and use the stairs.

Dr. Padma concluded her talk with a clear message that one needs to treat and monitor the risk factors such as hypertension and diabetes and quit smoking to prevent and control stroke.

Replying to a question raised by Sh. Shanker Jaiswal as to which oil should be used for cooking; Dr. Padma opined that amongst all the oils, mustard oil can be safely used in the northern part of the country. e sun ower oil can also be used in other regions of the country.

LIFE STYLE & DIET FOR STROKE PREVENTION

M.V.PADMA SRIVASTAVA
MD, DM, FRCP (EDIN), FAMS, FNASC, FIAN, FNA

PROFESSOR, HEAD, DEPARTMENT OF NEUROLOGY
CHIEF, NEUROSCIENCES CENTER
AIIMS, NEW DELHI

RISK FACTORS FOR STROKE
(for both 1° and 2° prevention)

Modifiable

- Hypertension
- Diabetes
- Cardiac disease
- Atrial fibrillation
- TIA / Prior stroke
- Dyslipidemia
- Cigarette smoking
- Alcohal abuse
- Obesity
- Physical inactivity
- Carotid stenosis
- Sleep apnea

Nonmodifiable

- Age
- Gender
- Race/ethnicity
- Heredity
- Stress

STROKE RISK FACTORS

Nonmodifiable	Modifiable
• Increasing age: risk doubles every 10 years a er the age of 55 years • Gender: women have a higher lifetime risk for stroke than men • Race and ethnicity: incidence is higher in Blacks, Hispanics, American Indians, and Alaska natives than Whites or Asians • Family history: possibly related to genetics and shared environmental and lifestyle in uences • Prior stroke: 10-year risk of recurrence is 43%	• Hypertension: systolic blood pressure ≥140 mm Hg or diastolic blood pressure ≥90 mm Hg • Hypercholesterolemia: low-density lipoprotein ≥100 mg/dL • Obesity: body mass index ≥30 kg/m2 • Physical inactivity:<30-60 minutes of aerobic activity 3-5 times per week • Diabetes • Smoking • Heavy alcohol consumption : >2 drinks for men and >1 for women per day

LIFE STYLE IS MUCH MORE IMPORTANT THAN MOST PHYSICIANS SUPPOSE

- Rate of cardiovascular mortality in people with stroke over a 10 year period : reduced by 90% on engaging in lifestyle behaviors such as eating sufficient fruits and vegetables, exercising, maintaining a BMI of < 29 Kg/m2 and not smoking!
- US Health Professionals Study
- Nurses Health Study
- Study in Swedish women & Men
- Five healthy lifestyle choices
- Not smoking, No alcohol, a body mass index < 25, daily exercise for 30 minutes and a healthy diet score in the top 40% had an 80% reduction of stroke compared with participants who achieved none!

PHYSICAL ACTIVITY

- Moderate to vigorous physical activity for primary stroke prevention leads to decreased blood pressure, LDL cholesterol, and weight loss
- Increased glucose uptake and insulin sensitivity in people with and without diabetes
- For people with stroke, exercise training can improved hypertension, lipid profiles. Glucose metabolism and insulin sensitivity
- Improved balance, gait speed and endurance and decreased disability

DIET

- What constitutes a Harmful Dietary trend?
- In the USA, the worst of the lifestyle choices is diet.
- The American Heart Association statistical report of 2015 indicated that only 0.1% of all Americans consumed a healthy diet and only 8.3% consumed a moderately healthy diet
- In China, the consumption of meat and eggs has increased
- Between 2003 and 2013, stroke mortality per 100,000 in urban people increased by 26.6% and coronary mortality increased by 213%

TRENDS IN DIETARY GUIDELINES

- Recommending reduction of intake of animal fat and increased intake of fruits and vegetables – a more plant based diet
- The Dietary Approaches to Stop Hypertension (DASH) diet emphasized fruits, vegetables and low-fat dairy foods with reduced intake of saturated fat, total fat and cholesterol; it included whole grains, poultry fish and nuts and was reduced in red meat, sweets, and sugar containing beverages.
- The Mediterranean diet also emphasizes whole grains, fruits ,vegetables but it is high in beneficial oils (olive and canola) low in dairy products and contains much mess animal flesh
- Ancel Keys the leader of the Seven Countries Study described it as : The heart of this diet is mainly vegetarian

EVIDENCE FOR THE MEDITERRANEAN DIET

- Seven Countries Study: coronary risk in Crete was 1/15th that in Finland and only 40% of that in Japan
- Low glycemic/high-fat diet with 40% of calories from beneficial fats such as olive and canola oils and high in whole grain , fruit, vegetables and legumes (peas, lentils, beans, nuts)
- In secondary prevention in the Lyon Diet Heart Study, the Mediterranean diet was approximately twice as efficacious as was simvastatin in the Scandinavian Simvastatin Survival Study (4S)
- In the PREDIMED (Spanish Primary Prevention of Cardiovascular Disease with a Mediterranean Diet study, a low fat diet was compared with two Mediterranean diet arms: one fortified with olive oil while the other fortified with mixed nuts. Both versions significantly reduced cardiovascular events by 50% over 5 years

PROBLEMS WITH LOW FAT DIETS

- Much has been said about how cholesterol is not the villain but the real villain is the sugar!
- This lead to a disastrous use of high animal fat and low carbo diet! And this was counter productive

GUT MICOBIOME AND THE BRAIN:EFFECTS OF INTESTINAL MICROBIOME

- Carnitine from red meat and phsophotidylcholine from egg yolk are converted by the intestinal bacteria to trimethylamine, in turn oxidized in the liver to trimethylamine n-oxide (TMAO) which causes atherosclerosis in animal models
- P-cresyl sulfate, hippuric acid, indoxyl sulfate, P-cresyl glucuronide, phenyl acetyl glutamine and phenyl sulfate.
- Toxic metabolites of the intestinal microbiome are renally excreted, so they are termed Gut derived Uremic Toxins (GDUT).
- Homocysteine is another molecule which accounts for changes on the carotid plaque burden

COFFEE AND TEA

- Recent meta analysis indicates that consuming 3-5 cups per day of coffee reduces cardiovascular risk.
- Benefits of coffee are from bioflavonoids
- Both green tea and other forms of tea reduce cardiovascular risk. Green tea lowers blood pressure and LDL cholesterol, and improves endothelial function
- Consumption of the bioflavonoids quercetin, kaempferol and myricetin may account for the reduction of myocardial infarction observed with black tea consumption
- Cardiovascular benefit has been associated with catechins

DIETARY SODIUM

- The International Study of Salt and Blood Pressure (INTERSALT) and the Dietary Approach to Stop Hypertension Trial (DASH) showed a significant inverse relationship between salt intake and both systolic and diastolic blood pressure
- A meta-analysis of large prospective studies revealed that higher salt intake is associated with significantly greater incidence of strokes and total cardiovascular events, with a dose dependent association

FLAVONOIDS

- Fruits, vegetables,, and beverages, including apples, berries, grapes, onions, red wine, tea, cocoa and dark chocolate
- Inherent potent antioxidant effects, with a range of biochemical properties, such as antioxidant, anti-inflammatory, and antithrombotic effects, inhibiting lipid peroxidation
- Prevention of atherosclerosis, promote vascular relaxation and have antihypertensive properties
- The highest levels of chocolate consumption were associated with a reduction in cardiovascular disease and stroke

CAROTENOIDS

- Carotenoids the pigments responsible for the yellow to red color of some fruits and vegetables
- Association between plasma levels of carotenoids and markers of inflammation, oxidative stress and endothelial dysfunction and arterial stiffness.
- Lycopene is the most powerful antioxidant amongst plasma carotenoids

FATS

- The major food sources of n-3-polyunsaturated fatty acids are deep and cold water fish such as salmon, trout and cod
- Oil of many species of marine fish are rich in eicosapentaenoic acid EPA and docosahexaenoic acid DHA
- Diet and Reinfarction Trial (DART) and GISSI, an Italian trial showed clear benefits of n-3-polyunsaturated fatty acids in reducing total mortality and sudden death
- Alpha-linolenic acid suggest a reduction in 35 to 50% on the stroke risk with increasing its intake. Its main sources are vegetable oils such as soybean, canola, and flaxseed. And also in walnuts!
- Replacing saturated fat by polyunsaturated or monosaturated fat is able to reduce both HDL and LDL-cholesterol
- Adoption of the Mediterranean diet, which encompasses the increased alpha-linolenic acid intake a reduction in saturated fat, and a modest increase in fiber was associated with a 72% reduction in recurrent coronary heart events in patients with prior MI.

CARBOHYDRATES

- The AHA released a scientific statement recommending reductions in added-sugar intake to no more than 100 to 150 Kcal/day for most
- Soft drink consumption is playing a role in the epidemics of insulin resistance, obesity, hypertension, stroke, dyslipidemia and type 2 DM in humans.
- Increased risk of stroke mortality is associated not only with high intake of carbohydrate, but also with the dietary glycemic index
- (GI) and glycemic load (GL)
- Increased fiber intake reduces blood pressure, blood glucose, serum triglycerides and LDL cholesterol

WHAT DIET WOULD BE RECOMMENDED FOR PATIENTS AT RISK OF STROKE?

DIETARY RECOMMENDATIONS FOR PATIENTS AT RISK OF STROKE

- No egg yolks: use egg whites, egg beaters, egg creations or similar substitutes.
- Flesh of any animal: a serving the size of the palm of the hand or less, ~every other day (or half that daily).
- Seldom red meat, mainly fish and chicken.
- High intake of olive oil and canola oil.
- Only whole grains.
- High intake of vegetables, fruit and legumes.
- Avoid deep-fried foods and hydrogenated oils (trans fats).
- Avoid sugar and refined grains, and limit potatoes.

BEHAVIORAL RISK FACTORS: SMOKING

- Independent risk factor
- 50% ↑ progression of carotid-intimal thickness
- Meta-analysis of 32 studies: RR of 1.5
- Cessation of smoking: 50% ↓ risk by 1 year

ALCOHOL

- ↑ level of alcohol consumption: ↑ risk of hemorrhagic stroke
- Nurses Health Study
- Japanese Study
- Northern Manhattan Study – J-shaped relationship between alcohol & ischemic stroke

SMOKING

- The risk of first ischemic stroke in smokers is nearly 4 times the risk of non smokers
- Cigarette smoking is an independent risk factor for stroke
- Increased stroke risk by contributing to acceleration of atherosclerosis
- Current smoking status has been associated with a 50% increase in progression of carotid intimal-medial thickness
- A meta-analysis of 32 studies found a relative risk of stroke for smokers of 1.5
- Dose-response relationship with increased stroke risk in heavy smokers compared with light smokers
- Passive exposure to cigarette smoke increases the risk of progression of atherosclerosis.

TAKE HOME MESSAGES 5 THINGS YOU CAN DO TO PREVENT A STROKE

I. Lower blood pressure:

- Maintain a blood pressure level not more than 120/80 mm Hg.

- **How to achieve it?**

1. Reduce salt in your diet. Ideally not more than half a teaspoon per day.
2. More polyunsaturated and monounsaturated fats in the diet and avoid saturated fats.
3. 4 to 5cups of fruits and vegetables per day; one serving of fish two to three times a week and several daily servings of whole grains and low fat dairy.
4. Get more exercise – atleast 30 minutes of activity per day.
5. Quit smoking. Period!

LOSE WEIGHT

- Goal: Ideal BMI 25 or less.

- **How to achieve it?**

1. Try to eat no more than 1500 t 2000 calories per day.
2. Increase the amount of exercise you do like walking, playing, or making activity a part of every single day.

OBESITY

1. Physicians Health Study
2. Abdominal obesity: > 40 “ in men; > 35 “in women.
3. Northern Manhattan Study
4. Promoting weight loss & maintenance of a healthy weight = high priority!

EXERCISE

- Goal: Exercise at a moderate intensity at least five days a week.

- **How to achieve it?**

1. Take a walk around your neighborhood every day.
2. Start a fitness club with friends
3. When you exercise reach a level at which your breathing hard but you can still talk.
4. Take the stairs instead of the elevator.
5. If you don't have a consecutive 30 minutes to exercise, break it up into 10 or 15 minute sessions a few times a day.

RECOMMENDATIONS FOR PHYSICAL ACTIVITY AFTER STROKE

Important considerations

- A health care professional should supervise initiation of a physical activity program
- Individuals at risk for cardiovascular events should undergo cardiac stress testing
- Heart rate and perceived exertion should be regularly monitored during physical activity

Aerobic activity

- Duration and frequency: 20- to 60-minute sessions, 3-5 d/wk
- Target: 55%-80% of maximum heart rate or perceived exertion of “light” to “somewhat hard”
- Multiple short sessions (eg, 10 minutes) to build tolerance and endurance are encouraged

Strength training

- Amount and frequency: 1-3 sets of 10-15 repetitions targeting large muscle groups, 2-3 d/wk
- Target: 50%-80% of 1 repetition maximum

Nonexercise physical activity

- Reduce sedentary time by standing and walking more often
- Examples: stand during tasks that could be completed sitting, reduce time viewing television, go for more frequent walks, use the stairs

TREAT & MONITOR RISK FACTORS

I. Treat Htn, DM, AF.

II. Quit SMOKING

Organizers and Expert Speakers

Organizers

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Expert Speakers

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