

# **“Under Pressure” The New Hypertension Guidelines**

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## **Course Description:**

This course will provide the latest information on hypertension (HTN) and hypertensive retinopathy (HTR). Emphasis will be newest HTN guidelines.

## **Goal:**

Provide attendees with the updated HTN guidelines, use of advance diagnostic modalities and treatment for HTR, and discuss integration of these into clinical practice.

## **Learning Objectives:**

At the conclusion of this course, attendees should be better able to effectively:

- 1) Apply the new hypertension definition, classification, and treatment target.
- 2) Identify, review, and outline treatment for hypertensive retinopathy.
- 3) Appreciate the latest technologies in diagnosis of hypertensive retinopathy- ultra wide-field imaging, multi-modal imaging with SD-OCT and OCT angiography (OCTA).
- 4) Be able to recognize HTN urgency and emergency (malignant HTN retinopathy).
- 5) Describe interprofessional team strategies for improving care coordination and outcomes in patients with hypertensive retinopathy

## **Abstract**

Hypertension is on the rise. With the new guidelines, nearly half of U.S. adults (46%), up from 32%, could be classified with high blood pressure. Detecting early retinal findings can prevent vision loss and, more importantly, disability and premature death from this disease.

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- I. Hypertension Key Facts
  - Hypertension- (“Silent killer”) is the most common primary diagnosis.
  - An estimated 103 million Americans (1 of every 3 adults)
  - Hypertension is a major cause of premature death worldwide. Risk for stroke, myocardial infarction (MI), vascular disease, and chronic kidney disease (CKD)
    - 69% of people who have a first heart attack (MI)
    - 77% of those who have a first stroke
    - 74% of those who have HF have a BP >140/90 mm Hg
  - “Silent killer”: mostly an asymptomatic, unless severely elevated, which is associated with headache, shortness of breath, and anxiety
  - Nearly *half* of people with high blood pressure (47.5 %) do not have it under control.
  - An estimated 46% of adults with hypertension are unaware that they have the condition.
  
- II. Latest Hypertension Clinical Practice Guidelines
  - Definition- The new guideline lowers the target for blood pressure treatment to 130/80 mmHg
  - Classification:
    - Elevated: Systolic between 120-129 *and* diastolic less than 80
    - Stage 1: Systolic between 130-139 *or* diastolic between 80-89
    - Stage 2: Systolic at least 140 *or* diastolic at least 90 mm Hg
  - Hypertensive crisis: Systolic over 180 and/or diastolic over 120, with patients needing prompt changes in medication if there are no other indications of problems, or immediate hospitalization if there are signs of organ damage.
  
- III. 3-type of ocular damage- Retinopathy, Optic neuropathy, and Choroidopathy.
  - Hypertensive Retinopathy (HTR)
    - Important warning sign (up to 80% of HTN)
    - Case presentation(s)
    - Pathophysiology
      - Retinal blood vessels have distinct features, which differentiate them from other blood vessels
        - The absence of sympathetic nerve supply
        - Autoregulation of blood flow
        - Presence of blood-retinal barrier
      - Persistent increase in BP causes certain changes in vessel wall:

- Intima layer: Thickening
  - Media layer: Hyperplasia
  - Arteriolar wall: Hyaline degeneration
- Early HTR
  - Focal arteriolar narrowing
  - Arteriolar/venule (AV) crossing changes: Gunn's Sign
  - Venous deflection (Salus 'sign)
  - Banking of vein distal to the crossing site (Bonnet's sign)
  - Changes in the arteriolar light reflex- Arteriolar sheathing (known as "silver" or "copper" wiring)
- Moderate-exudative phase
  - Disruption of the blood-brain barrier and leakage of blood and plasma into the vessel wall disrupting the autoregulatory mechanisms.
  - Retinal or flame-shaped hemorrhages, cotton wool spots, exudates
  - Follow-up: six- twelve weeks follow-up to assess for regression with the control of blood pressure
- Optic Neuropathy – Malignant HTR case presentation
  - Medical **emergency**
    - Anti-hypertensive agents (IV drip) for and admission to ICU
    - Goal: Lower Diastolic BP to approximately 100-105 over 2-6 hours
    - Maximum initial fall not to exceed 25%. More aggressive decrease (abrupt drop in BP) can lead insufficient perfusion pressures and organ damage resulting in an ischemic stroke and myocardial ischemia
    - If focal neurological symptoms present, obtain MRI to r/o acute stroke (rapid BP correction contraindicated)
    - *The mortality rate is 50% at 2 months and 90% at one year if untreated*
    - Management: Anti-VEGF for macula edema
- Choroidopathy- Case presentation
  - More common in YOUNG patients with acute severe HBP
    - Elschnig's spots-Focal area of RPE atrophy with associated pigmentations
    - Siegrist's line- Linear RPE pigmented changes that develop over sclerotic choroidal arteries

#### IV. Paradigm Shift in patient care:

- Early clinical findings necessitate referral to PCP for HTN management
  - Early HTR- Associated with 2X risk of stroke according to the ARIC study
  - Moderate HTN-2-3X more likely to develop a stroke (ARIC study).
  - HTN Urgency (Severe Hypertension + NO End Organ Damage)-

Patients with blood pressure greater than 180/110 require prompt evaluation and management with PCP.

- HTN Emergency- Malignant HTR Medical Emergency- Call 911 Neurological signs (headaches/ TIA or other neurological signs)
  - Visual field testing
  - MRI or CT scan- to r/o Hypertensive Encephalopathy

## V. Conclusion

- Hypertension is increasing at an alarming rate
- Optometry plays an important role in detecting the disease.
- By detecting the early warning sign of HTR, we can significantly impact not only the patient's visual and systemic health, but potentially save their lives

## References:

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