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In exercise of the powers conferred by Rule 39B and 133A of the Aircraft Rules,1937, the following requirements are hereby issued for information, guidance and compliance.

This AIC supersedes AIC 10/2008 dated 03-07-2008.


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DISPOSAL OF CASES OF HYPERTENSION IN CIVIL AIRCREW

1. **Background.** International Society of Hypertension (ISH) Global Hypertension Practice Guidelines 2020 recommends that hypertension be diagnosed when a person's systolic blood pressure (SBP) in the office or clinic is ≥ 140 mmHg and/or their diastolic blood pressure (DBP) is ≥ 90 mmHg following repeated examination. Hypertension is a known risk factor for cardiovascular and cerebrovascular as well as renal diseases, therefore, it is a major health concern in the aviation environment. This risk is present regardless of age, gender and ethnicity. It has been scientifically established that good blood pressure control significantly reduces these risks. The most recent epidemiological study reported that hypertension affects 24.1% of the adult male and 21.2% adult female population in India, reaching 48.4% in individuals aged 60 years or above. Therefore, considering the flight crew and ATCOs to be a subset of the Indian general population, they are at equal risk of developing hypertension.

2. **Clinical Condition.** Meticulous history including smoking, alcohol consumption, relevant family history of metabolic disorders should be given due consideration. Classification of Hypertension, based on ISH Global Hypertension Practice Guidelines 2020, is as follows:-

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

Table 1: Classification of Hypertension

The diagnosis of hypertension should be confirmed with 24 hours Ambulatory BP Monitoring (ABPM). In case of DGCA license holders employed in commercial airlines the ABPM report must be countersigned by the authorised medical attendant (AMA). The diagnosed cases of hypertension will be taken off flying duties & treated by his AMA, till satisfactory control of blood pressure is achieved.

3. **White Coat Hypertension (WCH).** WCH is an entity of aeromedical importance as it is often observed amongst DGCA license holders presenting for routine medical examinations. It is estimated to occur in 15 - 30% of general population who are presumed to have mild hypertension based on elevated BP recording in a clinical set-up. The definition of white-coat hypertension is an elevated blood pressure in a medical environment with normal blood pressure during 24-hours ABPM. Therefore, any license holder suspected to have White Coat Hypertension should have the following: -
- 3.1 Repeated office and out-of-office BP measurements suggest elevated BP greater than 140/90 mmHg only in the office
 - 3.2 Absence of Hypertension Mediated Organ Damage (HMOD)
 - 3.3 Normal 24-hours ABPM recording

4. Measurement of BP.

4.1 Blood Pressure (BP) should be measured as per ISH Global Hypertension Practice Guidelines 2020.

4.2 24-hours ABPM. White coat effect to be ruled out by using 24-hours ABPM. Apart from suspected White Coat Hypertension, ABPM is helpful to diagnose apparent drug resistance, episodic hypertension and autonomic dysfunction. 24-hours ABPM thresholds are as follows: -

Thresholds for Hypertension Diagnosis Based on 24 Hours ABPM*	
24 hours average	≥ 130 and/ or ≥ 80 mmHg
Awake (daytime) average	≥ 135 and/ or ≥ 85 mmHg
Asleep (night-time) average	≥ 120 and/ or ≥ 70 mmHg
Nocturnal dip	10 – 20%

* As per ISH Global Hypertension Practice Guidelines except Nocturnal dip

Table 2: Thresholds of 24 hours ABPM

5. Aeromedical Disposal.

5.1 Investigations & Assessment. A thorough history and clinical examination will be carried out in all diagnosed cases of hypertension to rule out underlying secondary cause. All relevant investigations will be carried out to rule out following conditions/aspects: -

- (i) Hypertension Mediated Organ Damage (HMOD)
- (ii) Possible causes of hypertension
- (iii) Cardiovascular risk factors

5.2 Initial workup

- (i) CBC, urine routine exam including microscopic examination and urine microalbumin
- (ii) Complete biochemical profile – FBS, PPBS, HbA1C, Urea, Uric Acid, Creatinine and Lipid profile
- (iii) Resting ECG, Echocardiography, TMT (if indicated)

- (iv) Fundoscopy, USG KUB, X Ray chest
- (v) Any other relevant investigations, considered appropriate

5.3 Permissible Medication. DGCA license holders with uncomplicated hypertension where other secondary causes having ruled out, may be started on anti-hypertensive drugs. It is preferable to initiate multiple agents at sub-maximal doses than to use a single agent at the top of the therapeutic range where side effects are more prevalent. Medications from maximum three (03) group of drugs (one drug from each group) from the following are permissible:-

- (i) Diuretics (excluding loop diuretics):- Hydrochlorothiazide, Indapamide etc [Maximum dose of 1.5 mg/day of Indapamide or equivalent]
- (ii) Cardio selective beta-blockers:- Metoprolol, Atenolol, Bisoprolol etc [Maximum dose of 100 mg/day of Atenolol or its equivalent]
- (iii) ACE inhibitors: Captopril, Enalapril, Ramipril, Lisinopril etc [Maximum dose of 20 mg/day of Enalapril or equivalent]
- (iv) Angiotensin Receptor Blockers: Telmisartan, Losartan, Olmesartan, Candesartan etc [Maximum dose of 80 mg/day of Telmisartan or equivalent]
- (v) Long acting Dihydropyridine Calcium Channel Blockers: Amlodipine etc (Maximum dose of 10 mg/day of Amlodipine or equivalent).
- (vi) List of not permissible drugs – as per ICAO doc 8984

5.4 Disposal for Class 1 & Class 2 License Holders: -

- (i) White-Coat Hypertension. Stress and anxiety are known to elevate blood pressure. Although White Coat Hypertension may not carry significant cardiovascular risk, the condition needs to be investigated. Confirmed White coat hypertension cases will be treated as being normotensive, but endorsement has to be made in CA-35, for follow up. Annual review will be carried with 24 hours ABPM report with a DGCA empanelled Class – 1 medical examiner.
- (ii) High Normal Hypertension. DGCA license holders with high normal BP range and controlled with non-pharmacological measures without any HMOD may be certified fit as PIC.

(iii) Grade 1 & 2 Hypertension

Class 1 & 2 DGCA license holders with diagnosed hypertension and on permissible anti-hypertensive drugs (in maximum permissible dose) are to be initially assessed as temporarily unfit for four (04) weeks. They will be reviewed at IAF boarding centre/DGCA empanelled Aeromedical Evaluation centre after four (04) weeks with 24 hours ABPM record and the opinion of treating physician. Subsequently after four (04) weeks, the license holders can be upgraded to PIC provided the 24 hours ABPM record is normal with no documented side effects of medication and an optimal BP control is maintained clinically during renewal. All further review will be carried out by DGCA empanelled Class – 1 medical examiners and approved civil medical centers. Licence holders are to be reviewed with 24 hours ABPM, all relevant investigations to rule out HMOD, along with opinion of treating physician. The license holders with well controlled blood pressure and on permissible drugs (up to three drugs in maximum doses) with no evidence of HMOD, will be assessed as 'fit for unrestricted flying duties'. Licence Holders detected with Grade I/II retinopathy, LAHB, Mild concentric LVH on Echocardiography with no other HMOD may be considered for unrestricted flying.

(iv) Change of drug or dosage. DGCA license holders requiring change of antihypertensive medication or dosage should be assessed as temporarily unfit for two (02) weeks. They will be reviewed after two (02) weeks at IAF boarding centre/DGCA empanelled center only, after an optimal BP control (with normal 24 hours ABPM record) is achieved and no documented side effects of medication along with opinion of treating physician.

(v) Tests for Annual Review for confirmed HTN cases

(aa) Fundus examination

(ab) 2D Echo

(ac) 24 hr ABPM

(ad) RFT

- (ae) Any other tests as deemed necessary
- (e) Disposal for Class 3 License Holders.
- (i) ATCOs with high normal BP range and controlled with non-pharmacological measures may be certified fit for ATC duties. ATCOs with Grade I/II retinopathy, LAHB, Mild concentric LVH on Echocardiography will be fit for ATCO duties.
- (ii) License Holders with diagnosed hypertension will be reviewed by DGCA empanelled Class 1 Medical Examiner after at least four (04) weeks of unfitness. Permissible medications include loop diuretics and Alpha adrenergic blockers along with four (04) permissible medications for Class 1 license holders. ATCOs whose blood pressure with a normal 24-hour ABPM record on permissible drugs with no evidence of HMOD may be recommended 'fit for unrestricted ATC duties'. The license holders will not be recommended for high altitude area postings (> 2700 metres).
- (f) Uncontrolled Hypertension. License holders with uncontrolled hypertension even with acceptable anti-hypertensive drugs in maximal dose will be evaluated only at IAF BC and will be recommended permanently unfit for flying duties unless the clinical status reverses. License holders with HMOD may be reassessed for fitness for flying duties in a graduated manner depending upon control of hypertension and extent of functional disability.
- (g) Secondary Hypertension. Cases of secondary hypertension will be comprehensively evaluated. The disposal of these cases will be assessed on a case to case basis.
6. Caution. Flight crew undertaking long duration, transcontinental flying should be advised by their company doctors about changes in drug consumption timing while they are away from home time zone.
7. This AIC is applicable for initial issue of licence medical examination also.

8. This AIC lays down only guidelines to assess DGCA License holder having Hypertension. All scenarios and complications cannot be covered through this AIC. Cases will be issued aeromedical assessment, based on individual merit of the case, type of License and expected duties.
