

**ADDENDUM TO SSR**  
**(SUBMITTED VIDE IAM LETTER NO. IAM/559/5/UTY Dt 09 FEB 16)**

**I - RESEARCH**

**1.1 External Agency Sponsored Research Projects**

1.1.1 AFMRC Project No 4236/2012: Comparison of physiological parameters on exposure to normobaric and hypobaric hypoxia in normal healthy Indian adults. (Ongoing, Final report will be submitted soon, letter dated 31 Jan 17 received from O/O DGAFMS).

1.1.2 AFMRC Project No 4738/2016: Effect of Selected Anti-hypertensive Drugs on Baroreflex Sensitivity and Relaxed +Gz Tolerance in Aircrew with well controlled Blood Pressure. (Ongoing Project, The project got sanctioned vide DGAFMS letter No 15965/4738/2016/DGAFMS/DG-3B dated 17 Oct 16).

1.1.3 AFMRC Project No 4744/2016: To study the effect of isolation and confinement on psycho-physiological responses in different age groups. (Ongoing project, the project got sanctioned vide DGAFMS letter No. 15965/4744/2016/DGAFMS/DG-3B dated 17 Oct 16).

1.1.4 ISAM Sponsored Project: Impact of using pre-cooling and Gel Cooled Vests during dry & humid heat stress and correlate it with physical and physiological parameters. (The DFR was submitted in Apr 2016).

**1.2 Departmental Projects**

1.2.1 Departmental project: To evaluate the effect of Modafinil on cardiovascular response to isometric handgrip test in healthy individuals (The DFR of the project was submitted in Sep 2016).

1.2.2 Departmental Project: To evaluate and compare autonomic neural function to cold pressor test before and after heat stress. (The DFR of the project was submitted and final project report is being prepared after addressing the issues and concerns of the two reviewers).

**1.3 Research Papers**

1.3.1 Sinha B, Dubey DK. Blood pressure variability and Baroreflex Sensitivity of a healthy male during cold pressor test that induced development of Neurocardiogenic Syncope. *J Basic Clin Physiol Pharmacol*. 2016;27(4):437-443.

1.3.2 Sinha B, Ghosh G. Teaching Series on Spirometry. *Ind J Aerospace Med*. 2016; Summer Issue.

1.3.3 Concept paper on Heat stress and Flying was prepared and submitted.

#### **1.4 Presentation in the Conferences (64<sup>th</sup> International Congress of Aviation and Space Medicine, 7-9 Nov 16, Delhi) – Research and case reports at IAM**

1.4.1 Effect of Modafinil on 'Autonomic Cardiovascular Function during Isometric Hand Grip Strength Test' - Sinha B & Khaling TDK.

1.4.2 Anthropometric variability and its effects on Aircraft cockpit design - Wg Cdr YS Dahiya.

1.4.3 Arachnoid cyst in a fighter aircrew: A case Report – Lt Col DK Khukhar

1.4.4 A case of intractable airsickness in a trained fighter aircrew: Dilemma in Aeromedical decision making – Sqn Ldr Biplab Bhowmick

1.4.5 Early detection of hearing loss in aviators by using smartphone applications – Wg Cdr Himanshu Swami.

1.4.6 Simulated multi-axial vibration stress on female observer's contrast sensitivity – Dr Savita Gaur.

1.4.7 Conflict management styles and resilience level of Indian civil aviators – SN Chaturvedula.

1.4.8 To study the relationship of body composition with G tolerance in Indian fighter pilots – Wg Cdr P Rastogi.

1.4.9 Study of morbidity and disability pattern of civil aircrew in india: Analysis of medical assessments – Lt Col P Biswal.

1.4.10 HBOT in frostbite less explored modality with excellent outcome: A case report – Dr DD Ghosh.

1.4.11 Ophthalmological disorders detected during medical examinations for Aircrew population – A 5 Year retrospective study – Dr MS Koutilya Choudary

1.4.12 A Closed globe Injury with therapeutic lens & lol implantation – Dr E Srihari

1.4.13 Disabilities detected during AME: A 5 yr retrospective experience - Dr E Srihari.

1.4.14 Retrospective analysis of Disabilities in female candidate reported for entry level medical Examination. A 5 yr retrospective analysis – Dr B Nandakishore.

1.4.15 Retrospective study of trend of calculus in Urinary system among IAF Officers – Maj Gaurav Rathi.

1.4.16 Retrospective analysis of Spinal disabilities in candidates: A 5yr study – Dr Isha Sah

1.4.17 Role of HBOT in treating a case of clostridial myonecrosis (Gas Gangrene) – Wg Cdr AVK Raju.

1.4.18 Only the stick was too long: Role of Human Engineering in ensuring occupant safety through cockpit design – Wg Cdr MD Sharma.

1.4.19 Anaemia in aviators – Lt Col Anurodh Gupta

1.4.20 Development of an equipment to measure centre of gravity of head mounted loads in aircrew – Lt Col P Biswal

1.4.21 Musculoskeletal disabilities among military aviators: Application of evidence based evaluation paradigms – Wg Cdr YS Dahiya

1.4.22 A Field based study on the efficacy of cooling vests having phase change material (PCM) in off-setting heat stress in the airfield tarmac maintenance personnel – Gp Capt MS Nataraja

1.4.23 Advanced analytical tools and protocols for toxicology screening to augment air crash investigations – Dr Santosh SR

1.4.24 Motion Sickness amongst aviators: An IAM experience – Mrs Kalpana Anand

1.4.25 Design and development of a novel TDCS system for performance enhancement Dr AS Aravind.

1.4.26 Effect of oral glucose on end tidal CO<sub>2</sub> on exposure to acute hypobaric hypoxia induced at simulated high altitude – Gp Capt Rahul Pipraiya.

1.4.27 Antihypertensives in fighter flying: IAF experience – Wg Cdr SS Rao

1.4.28 Change in relaxed +Gz tolerance following exposure to multi-axial acceleration – Sqn Ldr Renu Bhatt.

## **1.5 Encouraging Research**

1.5.1 Trainees have been allotted to all departments to conduct retrospective data analysis to improve their research acumen.

## **II - EVALUATION**

### **2.1 Workload**

2.1.1 There has been a substantial increase in all categories of aircrew reporting for medical examination at this Institute. It has been the Institute's endeavor to conserve the trained manpower and to complete the medical evaluation process latest by 1200h. Data pertaining to the medicals conducted over the last six years are as follows:-

Category	2012	2013	2014	2015	2016	2017 (till 20 Feb17)
Serving Officers/Aircrew	449	531	433	484	483	65
Candidates	707	735	734	547	367	118
Civil Aircrew	2236	1629	1421	1603	1772	179
<b>TOTAL</b>	<b>3392</b>	<b>2895</b>	<b>2588</b>	<b>2634</b>	<b>2622</b>	<b>362</b>

## 2.2 Data Digitization

2.2.1 The Institute has taken an initiative to digitize the existing medical evaluation data available as hard copy in the registers so that the same can be easily available and retrievable for research. A total of 16673 medical evaluations conducted since last 07 years have been digitized since 01 Aug 16 and the data is available in Excel Sheets at the Dept.

SL No.	YEAR	MEDICAL BOARD (AIR OFFRS + SERVING AIRCREW /OFFRS)	CIVIL AIRCREW (INITIAL + RENEWAL + FATA)	CANDIDATES (ALL CATEGORIES)
1.	2010	519	---	547
2.	2011	462	172	550
3.	2012	449	2236	707
4.	2013	422	1629	735
5.	2014	452	1421	734
6.	2015	504	1603	547
7.	2016	483	1772	367
8.	2017 (20 Feb17)	65	179	118
<b>TOTAL</b>		<b>3356</b>	<b>9012</b>	<b>4305</b>
<b>GRAND TOTAL</b>		<b>16673</b>		

## 2.3 Measures to reduce time of medical examination at IAM

2.3.1 MRI Appointment Slot at CHAFB for aircrew undergoing evaluation at MEC. To reduce the time being taken by military aircrew on TD to IAM for their Medical Evaluation, the Institute took up a case with HQ TC IAF to explore the possibility of having one appointment slot daily for MRI at CHAFB exclusively for aircrew undergoing evaluation. The same has been agreed upon by HQ TC IAF and CHAFB and daily one slot has been allotted since 01 Jun 16.

2.3.2 Local TD slots for CHAFB specialists relieving IAM specialists on planned leave. The Institute took up a case for having dedicated leave replacements from CHAFB for IAM specialists on planned leave. With the intervention of HQ TC, CHAFB has agreed on time-slots for clinical specialists to be compulsorily available

at IAM when IAM specialists are on leave. This ensures that all civil aircrew complete their medicals by 1200h, even on days when the Institute specialists are on leave since 01 Jun 16.

#### **2.4 Measures to reduce time of dispatch of medical documents after completion of medicals at IAM.**

2.4.1 An internal audit was carried out at MEC to understand the processes involved and time taken from completion of the AME/Medical Board to dispatch of the documents to Air HQ. With a rationalization of the processes, the average time has been reduced from 6.47 days in Jul 15 to 3.19 days in Jul 16 and from 4.1 days in Aug 15 to 2.40 days in Aug 16. The processes are now in place and being monitored. All documents are being dispatched within 2 working days after completion of medical.

2.4.2 A similar introspection of the dispatch of medical files of civil aircrew revealed that the dispatch was being done once in 7-10 days and the bottleneck was the wait to fill the bags designed by DGCA to send them in. After ensuring additional bags from DGCA, the files are being dispatched twice weekly by speed post through BNPL.

2.4.3 DGMS (Air) had directed on 29 Sep 16 that all the up-gradation medical boards of aircrew from IAM be sent by e-mail through official mail client i.e. I-Key to reduce the transit time with effect from 08 Oct 16 as desired by the CAS. Accordingly, all the up-gradation medical boards are being scanned and mailed through I-Key for e-vetting and approval by Air HQ within one working day after medical from 08 Oct 16. Air HQ after e-vetting the medical board, release the approved medical category by signal to the concerned unit with copy to IAM without waiting for the hard copy. The hard copies of the medical board are being forwarded through routine channel as before. This has ensured the optimum level of Op effectiveness of our most important human resource i.e. our aviators on return to flying fitness after disease/ disability. As on 20 Feb 17, we have forwarded 100% up-gradation medical boards totaling to a total of 71 to Air HQ through I-Key.

2.4.4 Another internal audit was carried out at MEC to understand the processes involved and time taken from completion of the recruitment medical examination of the candidates to dispatch of the documents to Air HQ. With a rationalization of the processes, the average time has been reduced from 5.8 days in Oct 15 to 1.5 days in Oct 16 and from 3.5 days in Nov 15 to single day in Nov 16. The processes are now in place and being monitored.

#### **2.5 Onsite availability of Lab investigation facilities at SMC IAM located at MP Camp.**

2.5.1 All the patients including the dependents of ASTE, IAM, SDI, 26 ED and other HAL based units reporting to SMC at MP Camp used to come to IAM Lab for investigations advised by the AMA which is 1.5 km away. Even all the air warriors reporting to SMC for their AME/Med Board also used to come to IAM lab for their routine investigations which was not only causing a loss to the precious man-hour but also was causing inconvenience to our clientele. Hence, to prevent the loss of man-hour and to provide medical care as close to our clientele as possible according

to the KRAs of DGMS (Air), we have established the lab investigation facilities from within our existing resources of IAM for all the routine investigations at SMC MP Camp since 01 Dec 16. This has resulted into optimal clientele satisfaction.

## **2.6 Infrastructure improvement.**

2.6.1 The Institute has also taken initiatives for improvement of the infrastructure. A new 'Executive Lounge' for the aircrew has been made operational since 01 Dec 16 for providing healthy breakfast to all the civil and serving pilots.

2.6.2 A new Audiometry Room has been constructed at a cost of 10.50 lakhs for accurate assessment of hearing acuity.

2.6.3 The Induction Room for the candidates has also been renovated. Procurement of CCTV for the Dept is also under process and the PDC is Apr 17.

2.6.4 To augment the efficacy of the air conditioning, Roman blinds have been installed at the Lecture halls at the training wing.

## **III - TRAINING**

### **3.1 Proposal for revision of syllabus**

3.1.1 INTAM – Introductory course in Aviation Medicine. A proposal has been forwarded for rehash of the course content based on the requirement of Medical officers of IAF in Field and increase in duration by 02 weeks. Further to this planning for commencing the course concurrently with the Primary course is also being explored. This shall save a large no. of training hours for the faculty to be put to additional use.

3.1.2 ICMAAM – Introductory Course for Medical Assistants in Aviation Medicine – A reduction in the duration of the course has been proposed from 04 weeks to two weeks.

3.1.3 Civil Aviation Medical Examiners Course – There were two kinds of courses for the civil aviation medical examiners for 1 & 2 weeks. A proposal has been forwarded for a single type of Civil Aviation Medical Examiner's course for two weeks.

### **3.2 Proposal for new courses**

3.2.1 NVG: Train the Trainer course – towards standardization of NVG Training in IAF.

3.2.2 Modular courses in Aviation accident investigation, Aerospace Physiology & Hyperbaric Medicine.

3.2.3 Qualified OPTRAM instructor course - towards standardization of OPTRAM Training in IAF

3.2.4 Army Aviation Specific Primary Course in Aviation Medicine – Army Aviation Corps has squadrons comprising only of single and double engine helicopters. The role of the Army Aviation Corps is inherently different from that of IAF thus mandating a different schedule and syllabus of training.

### **3.3 Conduct of new course**

3.3.1 Two days Anthropometry course - to enhance standardization and to minimize inter-observer bias.

### **3.4 Examination / Evaluation of training**

3.4.1 Open book examination - 'Exercise Khuli Kitaab' to improve on library referencing with feedback for improvement from faculty.

3.4.2 Monthly essay assignment with structured feedback from faculty, in form of a presentation with discussion over weaknesses and ideal way of approaching a topic.

3.4.3 Monthly quiz during the cohesion days.

### **3.5 Feedback of training**

3.5.1 Feedback on classes from trainees at the end of the day / week and course.

3.5.2 Random monitoring of classes by the Chief Instructor and Principal on daily basis.

3.5.3 Instructor rating on a five point scale for each class has been started and subsequent classes of instructors rated three and below are personally monitored for betterment by Commandant/ CI.

### **3.6 Out-station Educational Visits**

3.6.1 Reinitiating outstation educational visits (study tour) to operational bases and aviation industry establishments

### **3.7 Faculty Conferences**

3.7.1 Training conference chaired by the Principal on the progress of training on monthly basis.

3.7.2 Training conference chaired by Chief Instructor on weekly basis with OIC training and trainees at the beginning of each week and on last working day of the week.

3.7.3 Weekly Conference chaired by the Principal on progress and quality of research with proposal of new ideas.

3.7.4 Weekly Conference on progress, availability & utilization of funds as per schedule

3.7.5 Weekly Conference on event planning and progress specific to Diamond Jubilee events by the Secretary IAM Diamond jubilee chaired by Principal.

3.7.6 Weekly Conference on Administrative issues with officers and personnel on cohesion day observed every week.

### **3.8 Institution of 'Mentor' support for MD residents**

3.8.1 Each resident is allotted with a faculty member as a Mentor.

3.8.2 The resident interacts with the faculty on informal basis on minimum weekly basis and keeps a record of the same.

3.8.3 The role of a mentor is that of a friend, philosopher and guide on issues in addition to academic.

3.8.4 The Mentor is duty bound to provide all support and guidance to issues including personal and family issues and bring to the notice of the Principal where intervention may be deemed necessary

### **3.9 Extra-curricular Activities**

3.9.1 Trainees are encouraged to participate in cultural events during social functions and events.

3.9.2 Trainees participate in organization of major conferences and seminars to hone their managerial skills. Trainees were part of stage management, Reception and scientific sessions including Slide Presentations of the International Congress of Aerospace Medicine (ICASM – 2016).

3.9.3 Trainees participate in all sports related activities at the Institute viz. Basketball, Volleyball, Badminton etc.

3.9.4 Trainees have participated in developing indigenous basic aerospace medicine training videos.

### **3.10 Foreign Course Abroad**

3.10.1 Lt Col Deepak Khukhar underwent the Advance Aerospace Medicine International Medical Officers (AAMIMO) course of six months duration conducted by US Air Force at Dayton Ohio. He is now the fifth faculty at IAM trained in the US.

### **3.11 Introspection in Training**



3.11.1 Since Apr 2016, one of the key areas of the Institute has been to introspect on all training being imparted at this Institute; be it for Aircrew, Medical Officers, Medical Assistants or non- medical Mentors.

3.11.2 The basis / process of introspecting / rationalizing each course has been as follows:-

3.11.2.1 Each faculty to analyse each class allotted to the department.

3.11.2.2 To assess what is being taught vs what is in the syllabus.

3.11.2.3 Utility of the class in real world.

3.11.2.4 Terminal objective of the class vs training objective of the course.

3.11.2.5 Recommendation by the faculty; whether class to be retained/ deleted or a new class required to be added.

3.11.3 Each faculty would then discuss his/ her recommendation in a training review meeting.

3.11.4 This process was carried out for one course at a time.

3.11.5 Outcome. All courses being taught at IAM have been analyzed. The summary of revision in the course content / duration / frequency as stated earlier in para 3.1 are summarized as follows:-

<b>Course</b>	<b>Existing duration</b>	<b>Recommended duration</b>	<b>Frequency</b>	<b>Proposal submission to Air HQ (RKP)</b>
INTAM	3 wks	5 wks	4/yr	IAM/343/1/Trg dt 17 May 16
ICMAAM	4 wks	2 wks	2/yr	IAM/ 348/1/ Trg dt 31 Oct 16
AME Course	One week	2 wks	3/yr	IAM/352/4/Trg dt 01 Feb 17

#### **IV - CONSULTANCY**

4.1 Provided consultancy

4.1.1 The Institute provided consultancy to DRDO/ DEBEL in development of Integrated Life Support System (ILSS) for Light Combat Aircraft (LCA) – ‘Tejas’ and Fire Retardant Anti-G suit (AGS).

4.1.2 Evaluation and follow up of G-RAFFE Anti G suit and FR Anti-G suit PU Mark VI being developed by DEBEL.

4.1.3 Formulation of a training program of Ejection Procedure Simulator which have been installed at No1 and 2 AMTCs.

4.1.4 Airworthiness certification for oxygen cylinder for use in Patient Transfer Unit in IAF.

4.1.5 Development of Common Helmet Mask for Euro/MiG/Hepr series of aircraft.