Dr (Major) Amit Tak (Veteran), MBBS, MD, MCA, PG Diploma in Statistical Techniques

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: https://www.amitresearch.com/
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: https://scholar.google.com/citations?user=aO8jo7YAAAAJ&hl=en

DOB: Jul 08, 1981

Nationality: Indian

Educational Qualifications:

- ***MD Physiology*** (2016-2019)
  Rajasthan University of Health Sciences, Jaipur, India

- ***Bachelor of Medicine and Bachelor of Surgery*** (2000- 2005)
  University of Rajasthan, Jaipur, India

- ***Fellowship in Critical Care Medicine***
  Medvarsity, New Delhi, India

- ***Master of Computer Applications*** (2017-2020)
  Jaipur National University, Jaipur, India

- ***PG Diploma in Applied Statistical Techniques*** (2018- 2019)
  Indira Gandhi National Open University, New Delhi, India

- ***BSc Mathematics (Major) (I year completed)***
  Indira Gandhi National Open University, Jaipur, India

Certifications

- ***Computational Neuroscience*** (University of Washington)
  Verify at coursera.org/verify/VCWEZBRXQJWN

- ***Data Scientist's Tool Box*** (Johns Hopkins University)
  Verify at coursera.org/verify/G8M3VRUX3FXE

- ***R Programming*** (Johns Hopkins University)
  Verify at coursera.org/verify/RP4R33FQ8Z7S

- ***Introduction of Clinical Data Science*** (University of Colorado)
  Verify at coursera.org/verify/T5AYZGD5H9YB

- ***Introduction to Statistics & Data Analysis in Public Health*** (Imperial College London)
  Verify at coursera.org/verify/GEF4EYMV46MN

- ***Basic Course in Biomedical Research*** (ICMR- National Institute of Epidemiology)
  Verify at http://nptel.ac.in/noc (Roll No. NPTEL19GE33S1444719)

- ***Foundation course in SNOMED-CT (SNOMED International)***
  Verify at https://elearning.ihtsdotools.org/mod/simplecertificate/verify.php
  (Certficate Id: 6052d524-38fc-4520-a883-7e52b90df45d)

- ***Machine Learning*** (Stanford University) (continuing)

PROFESSIONAL EXPERIENCE

Summary of Experience

- *Have foundations in mathematical and theoretical human physiology with applications in precision medicine using computational techniques.*

- *Become highly motivated academician and researcher enthusiastic* ***in applying tools of Mathematical Modeling, Machine learning, Computational and Simulation approaches****, Systems Biology,* ***Non-linear Dynamics****, Network Theory, and Information Theory in understanding human function and behavior.*

- ***Areas of fundamental interests*** *include Electrophysiology, Computational Neuroscience, Brain-Computer Interfaces, Precision Medicine, Artificial Organ Manufacturing, and Biological Signal Processing.*

- ***Software platforms:*** *MATLAB (Coding, Simulink, Simbiology), NEURON, JASP, and R.*

- ***Freelance data analysts*** *have applied various statistical methods, including descriptive statistics, inferential statistics, regression models, ANOVA, ANCOVA, survival analysis, ARIMA modeling, and machine learning classifications.*

POSITIONS HELD

Project Number: 15.D1: A Brain Function Index apparatus to neurologically evaluate cognition

Job Title: Mathematical Physiologist

- Data analysis of EEG, ERPs signals on EEGLAB and ERPLAB packages using MATLAB and source localization using LORETA software.
- PI: Dr. Mahesh Jayachandra (Bio-design Innovator, BBI2, BSSE, IISc, Bengaluru, India)

Department of Physiology, RVRS Medical College & Hospitals, Bhilwara (Jul 2021 – present)

Job Title: Assistant Professor (Physiology)

- Mentoring first-year medical undergraduates with a focus on Systems Physiology.

Centre for Converging Technologies, University of Rajasthan (Sep 2019 – present)
Job Title: Visiting Faculty (Nonlinear Dynamical Systems and Computational Neuroscience)

- Deliver online lectures on
    - ‘***Non-linear Dynamical Systems and its application in Neuroscience,’*** including concepts of differential and difference equations, phase space, trajectory, bifurcations, limit cycle oscillations, and chaos to students of M.Tech (Neuroscience).

    - ***Computational Neuroscience***, including ion channel modeling, models of action potential like the Hodgkin-Huxley model, Morris Lecar Model, and FighHugh Nagumo models, models of synaptic transmission, and simple circuitry. Models were simulated on Simulink and with non-linear dynamical analysis.

    - ‘*Neuroimaging of Cognition’* and ‘Clinical neuroscience,’ including EEG/ERP, EMG, NCV, and fMRI applications.

    - ‘Computation and Modelling in Neuroscience.’

ICMR – National Centre for Disease Informatics and Research, Bengaluru (Oct 2020 – May 2021)

Job Title: Project Scientist C (Medical)

- As a part of the **National Digital Health Mission,** contributed to the development of NCDIR e-Mor software. The software involves SNOMED CT principles based on AI and NLP concepts.

- Conducted monitoring, coordinating, data management, analysis, report writing, and dissemination activities in the **National Cancer Registry Program.**

Department of Physiology, SMS Medical College & Hospitals, Jaipur (Oct 2019 – Oct 2020)
Job Title: Senior Resident

- Performed simulation of '***Hodgkin-Huxley Models of action potential and synaptic transmission*** in International Conference on Basic and Applied Physiology at Government Medical College, Dungarpur, Rajasthan.

- Addressed ***Computational methods in Sports Science and Exercise Physiol****ogy* at a conference at Manipal University, Jaipur, organized by the Ministry of Science and Technology, Government of Rajasthan.

- Development of concepts of precision medicine with the *presentation of* ***Cobelli's Glucose Insulin model*** in Clinico-pathological conference entitled '***Brief Introduction to Computational Physiology****'* at SMS Medical College, Jaipur. It involves the calculation of personalized insulin dosing in diabetic patients.

- Conducted seminars on mathematical models of G-protein coupled receptors, gene regulatory networks, models of glomeruli, shock, etc.

- Member of ***COVID-19 Research Committee and Infectious Disease Prevention Committee*** of the institute.

Department of SMS Medical College & Hospitals, Jaipur (May 2016 – May 2019)
Job Title: Junior Resident

- The thesis topic was based on electrophysiological measurements of heart activity, i.e., "Heart Rate Variability in patients with newly developed hypertension and healthy controls."

- Involved as coauthor in other research works that include multiple domains of study in medicine and academics.

Divisional Railway Hospital, Indian Railways (Apr 2014 – Oct 2014)
Job Title: Contract Medical Practitioner

Army Recruitment Office, Pithoragarh (Aug 2013 – Jan 2014)
Job Title: Recruiting Medical Officer

Military Hospital , Nasirabad (Aug 2010 - Jul 2013)
Job Title: Medical Officer, Officer-in-Charge (Section Hospital, Jaisalmer)

160 Military Hospital, Masimpur (Apr 2009 – Aug 2010)
Job Title: Medical Officer

457 Field Hospital, Aizawl (Jan 2008 – Apr 2009)

Job Title: Regimental Medical Officer

Military Hospital, Jaipur (Sep 2007 - Jan 2008)
Job Title: Medical Officer

AWARDS & HONORS

- SSM with Clasp Bengal & Assam (2010, Indian Army)
- Samanya Seva Medal with Clasp Mizoram 1965 (2010, Indian Army)
- Spl Service Medal with Clasp Suraksha (2010, Indian Army)
- National Scholarships Scheme (1998, Ministry of Human Resource Management)

MEMBERSHIPS

- American Physiological Society
- Organization for Computational Neuroscience
- Association for Advancement of Artificial Intelligence
- Aerospace Medicine Association

Reviewer

1. Informatics in Medicine Unlocked, Elsevier Publications – 2
2. BMC Health Services Research, Springer Nature – 1

PUBLICATIONS

Neuroscience publications

1. Patel Bhoopendra, Kumawat Ashok Kumar, Gupta Kapil, Mathur Kapil Dev, Tak Amit 2020 Inter and Intra-Hemispheric Resting EEG Coherence in Schizophrenia Patients. Scholars Journal of Applied Medical Sciences 8(1)209-216.

2. M Shah, B Patel, JK Gupta, K Gupta, A Saini, K Yadav, A Tak, A Dube A case-control study of P300 and P100 components of visual event-related potentials in dyslexic children during target detection task. Rajasthan Medical Journal 1 (12/2019), 15-23 Available from https://education.rajasthan.gov.in/content/dam/doitassets/education/medicaleducation/sms-medical-college-jaipur/pdf/RMJ/Medical%20Jounal%20Book%20Decmber%202019.pdf

3. Soni S, Dube A, Verma A, Gupta K, Gupta J, Saini, Patel B, Tak A .2017. Neurodynamics in patients with Alzheimer's disease during a writing memory task. Scholars Journal of Applied Medical Sciencs5(8D), 3257-3263.

4. Saxena S, Gupta K, Gupta J, Sharma A, Patel B, Saini A, Tak A, Gupta KK and Dube A. 2017. Neurodynamics of Temporal Lobe Epilepsy in Fronto-central region of Cerebral Cortex. Sch. J. App. Med. Sci.,5(7E)2829-2829.

5. Lubaina Jetaji, Bhoopendra Patel, Manoj Choudhary, Amit Tak, Kapil Gupta1, Jitendra Gupta1, Kavita Yadav, Amitabh Dube. The electroencephalographic (EEG) Power Spectral Densities (PSDs) of Theta and Alpha Frequency Wave-Forms During Information Processing of Language Comprehension: A Window to Neural Dynamics of Human Mind. Neuropsychological Trends

Accessed from: https://www.ledonline.it/NeuropsychologicalTrends/allegati/Neuropsychological-Trends-Early-access-Jetaji.pdf

Computational Medicine publications

6. Bhandari S, Shaktawat AS, Tak A, Patel B, Gupta J, Gupta K, et al. Independent role of CT chest scan in COVID-19 prognosis: evidence from the machine learning classification. Scr Med 2021 Sep;52(4):273-8. Accessed from: http://scriptamedica.com/wp-content/uploads/2021/12/05-BHANDARI-et-al-FINAL-02.pdf

Epidemiology publications

7. Bhandari S, Tak A, Singhal S, Shukla J, Patel B, Shaktawat AS, et al. Patient flow dynamics in hospital systems during COVID-19: Cox proportional hazard regression analysis. [Internet]. Frontiers in Public Health; 2020. Available from: DOI: 10.3389/fpubh.2020.585850

8. Tak A, Das B, Shah M, Dia S, Dia M, Gahlot S (2021) COVID-19 and Lockdown in India: Evaluation using Analysis of Covariance. J Antivir Antiretrovir. 13:216.Available from: https://www.longdom.org/open-access/covid19-and-lockdown-in-india-evaluation-using-analysis-of-covariance.pdf

9. Tak A, Dia S, Dia M, Wehner TC Indian COVID-19 Dynamics: Prediction using Autoregressive Integrated Moving Average Modeling. 52 NO. 1 (2021): Q1/MARCH. Available from: https://doi.org/10.5937/scriptamed52-29893

10. Bhandari S, Shaktawat AS, Tak A, Shukla J, Patel B, Singhal S, Gupta J, Kakkar S, Dube A, Dia S, Dia M. Evidence-based decision making and covid-19: what a posteriori probability distributions speak. Journal of Ideas in Health. 2020 Dec 31;3(Special2):286-92. Available from: https://jidhealth.com/index.php/jidhealth/article/view/88

11. Bhandari S, Shaktawat AS, Tak A, Patel B, Gupta K, Gupta J, Kakkar S, Dube A. A multistate ecological study comparing the evolution of cumulative cases (trends) in top eight COVID-19 hit Indian states with regression modeling. Int J Acad Med [serial online] 2020 [cited 2020 Jun 30];6:91-5. Available from: http://www.ijam-web.org/text.asp?2020/6/2/91/287965

12. Bhandari S, Shaktawat AS, Tak A, Patel B, Shukla J, Singhal S, Gupta K, Gupta J, Kakkar S, Dube A. Logistic regression analysis to predict mortality risk in COVID-19 patients from routine hematologic parameters. Ibnosina J Med Biomed Sci [serial online] 2020 [cited 2020 Jun 30];12:123-9. Available from: http://www.ijmbs.org/text.asp?2020/12/2/123/288204

13. Kakkar S, Bhandari S, Singh A, Sharma R, Mehta S, Gupta J, et al. Coronavirus disease of 2019: The premise for framing strategies towards infection prevention control management. Current Medical Issues [Internet]. 2020;18(3):199. Available from: http://dx.doi.org/10.4103/cmi.cmi_82_20

14. Kakkar S, Bhandari S, Shaktawat A, Sharma R, Dube A, Banerjee S, et al. A preliminary clinico-epidemiological portrayal of COVID-19 pandemic at a premier medical institution of North India. Annals of Thoracic Medicine [Internet]. 2020;15(3):146. Available from: http://dx.doi.org/10.4103/atm.ATM_182_20

15. Bhandari S, Singh A, Sharma R, Mehta S, Dube A, Gupta J, Gupta K, Tak A, Kakkar S. The proposed bridging management protocol for COVID-19. Menoufia Med J [serial online] 2020 [cited 2020 Nov 22];33:1109-10. Available from: http://www.mmj.eg.net/text.asp?2020/33/3/1109/296653

16. Bhandari S, Shaktawat A, Patel B, Dube A, Kakkar S, Tak A, Gupta J, Rankawat G. The sequel to COVID-19: the antithesis to life. jidhealth [Internet]. 1Oct.2020 [cited 22Nov.2020];3(Special1):205-12. Available from: https://www.jidhealth.com/index.php/jidhealth/article/view/69

17. Bhandari S, Sharma R, Singh Shaktawat A, Banerjee S, Patel B, Tak A, et al. COVID-19 related mortality profile at a tertiary care centre: a descriptive study.Scr Med 2020;51(2):69-73. DOI:10.5937/scriptamed51-27126

18. Bhandari S, Shaktawat AS, Sharma R, Mehta S, Patel B, Gupta K, Singhal SK, Gupta J, Kakkar S, Yadav K, Tak A, Dube A. COVID-19 – a descriptive study of demographic trends in Rajasthan, listed in top five affected states of India. Menoufia Med J [serial online] 2021 [cited 2021 Mar 27];34:328-32. Available from : http://www.mmj.eg.net/text.asp?2021/34/1/328/312011

19. Sudhir Bhandari, Amitabh Dube , Bhoopendra Patel, Amit Tak , Minal Kachhawa, Jitendra Kumar Gupta , Kapil Gupta , Shivankan Kakkar Gain of function research: The clairvoyant lens on pandemics. Modern medicine 2021, 28(3):269-274. Accessed from: DOI:10.31689/rmm.2021.28.3.269

20. Prevalence of text neck syndrome among doctors (Under review in **Medical Journal of Dr D. Y. Patil Vidhyapeeth; Manuscript ID: mjdrdypu_726_20**).

Clinical Science publications

21. Sudhir Bhandari, Ajit Singh Shaktawat, Amit Tak, , Jyotsna Shukla , Jitendra Gupta, Bhoopendra Patel, Shivankan Kakkar, Amitabh Dube, Sunita Dia, Mahendra Dia, Todd C. Wehner. Evaluating interactions between hyperglycemia and clotting factors in patients suffering from SARS CoV-2 infection. *Clinical Diabetology 2021;10(1):114-122.* Available from**:** DOI: 10.5603/DK.a2021.0022

22. Bhandari S, Shaktawat AS, Tak A, Shukla J, Gupta J, Patel B, Kakkar S, Dube A, Dia S, Dia M, Wehner TC. Relationship Between ABO Blood Group Phenotypes and nCOVID-19 Susceptibility–a Retrospective Observational Study. Scr Med 2020;51(4):217-22 Available from: https://aseestant.ceon.rs/index.php/scriptamed/article/view/29692

23. Rankawat G, Bhandari S, Singh A, Bagarhatta M, Dube A, Kakkar S, et al. Evaluation of clinico–Radiological profile and correlation with ultrasonography of the chest in coronavirus disease 2019 pneumonia. Indian Journal of Medical Specialities [Internet]. 2020;11(2):70. Available from: http://dx.doi.org/10.4103/INJMS.INJMS_55_20

24. Sharma Dhruva, Sharma Anil, Tak Amit et al. Hyperlactatemia as a potent marker of early morbidity and mortality in non-emergent open-heart surgical procedures. **(Under review in Indian Journal of Health Science and Biomedical Research; Manuscript ID- Kleuhsj 11 21).**

25. Somendra S, Tak A, Shukla J, Gupta K, Gupta J. Investigating dysautonomia of Bradbury Eggleston Syndrome: A case report Accessed from: https://view.publitas.com/amph/rjn_2021_3_art-20/page/1

Pharmacology publications

26. Jain C, Sharma L, Advani U, Kumar M, Tak A, Jain M. A cross-sectional study of sociodemographic and clinical profile of HIV patients at ART plus centre, Sawai Man Singh Hospital, Jaipur, India. jidhealth [Internet]. 21Mar.2021 [cited 22Mar.2021];4(1):321-6. Available from: https://www.jidhealth.com/index.php/jidhealth/article/view/89

27. Bhandari S, Singh A, Sharma R, Rankawat G, Banerjee S, Gupta V, Dube A, Kakkar S, Sharma S, Keswani P, Agrawal A. Characteristics, Treatment Outcomes and Role of Hydroxychloroquine among 522 COVID-19 hospitalized patients in Jaipur City: An Epidemio-Clinical Study. J Assoc Physicians India. 2020:13-9.

28. Bhandari S, Shaktawat AS, Patel B, Rankawat G, Tak A, Gupta JK, Kakkar S, Dube A. Hydroxychloroquine in Rheumatological Disorders: The Potential Buffer Against Coronavirus Disease-19? J Med Sci Health 2020;6(3):58-65. Available from : https://doi.org/10.46347/jmsh.2020.v06i03.010

29. Descriptive analysis of adverse drug reactions to antiretroviral therapy: Causality, severity and preventability assessment in a tertiary care teaching hospital **(Accepted in International Journal of Academic Medicine Manuscript ID - IJAM_1_21).**

Physiology and Yoga publications

30. Aggarwal N, Shukla J, Purohit S, Tak A, Patel B. A cross-sectional study on cardiac autonomic functions in psoriasis patients. National Journal of Physiology, Pharmacy and Pharmacology [Internet]. 2020;(0):1. Available from: http://dx.doi.org/10.5455/njppp.2020.10.05125202019052020

31. Meena S, Shukla J, Meena P, Tak A, Patel B. A case-control study of autonomic function tests in male cigarette smokers and healthy control subjects. Natl J Physiol Pharm Pharmacol [Internet]. 2020;(0):1. Available from: http://dx.doi.org/10.5455/njppp.2020.10.07175202011072020

32. Tak A. A study of frequency domain analysis of heart rate variability in newly diagnosed hypertensives. Journal of Medical Science And clinical Research [Internet]. 2019 Aug 16;7(8). Available from: http://dx.doi.org/10.18535/jmscr/v7i8.79

33. AK Kumawat, A Tak, G Kapil, GJ Kumar A study of time-domain analysis and Poincare plot analysis of heart rate variability in newly diagnosed hypertensives. Rajasthan Medical Journal 1 (2019/12), 41-4 Available from: https://education.rajasthan.gov.in/content/dam/doitassets/education/medicaleducation/sms-medical-college-jaipur/pdf/RMJ/Medical%20Jounal%20Book%20Decmber%202019.pdf

34. GMS Dhaka, M Sharma, R Sharma, A Singh, A Tak An interventional study to assess the effect of yoga on clinical and biochemical parameters in patients of rheumatoid arthritis. Rajasthan Medical

Journal 1 (2019/12), 46-51. Available from : https://education.rajasthan.gov.in/content/dam/doitassets/education/medicaleducation/sms-medical-college-jaipur/pdf/RMJ/Medical%20Jounal%20Book%20Decmber%202019.pdf

Microbiology publications

35. Gupta P, Sharma R, Vyas A, Tak A. Comparative evaluation of broth microdilution with E-test, Vitek 2, and disk diffusion for susceptibility testing of colistin on Gram-negative bacteria. Indian J Med Sci 2021;73(1):93-8. DOI : 10.25259/IJMS_15_2020

36. Mukul Chaurasia, Neha Agrawal, Ankita Chourasia et al. Isolation, characterization and antibiotic susceptibility of staphylococcal isolates, with special reference to methicillin-resistant Staphylococcus aureus, from anterior nares of health care workers in a tertiary health care centre. Scr Med 2021 Jun;52(2):85-95. DOI: 10.5937/scriptamed52-31190

Radiology publications

37. Jagmohan Gupta, Parul Gupta, Suresh Chandra Gupta, Amit Tak The role of multidetector computed tomography (MDCT) in evaluation of lung nodule with histopathological correlation. Scr Med 2021 Sep;52(3):193-8. DOI : 10.5937/scriptamed52-31903

Academics publications

38. Anshul Sharma, Hemant Tahilramani, Minakshi Misra, Sheshav Somani, Amit Tak. Objective Structured Practical Examination as a tool of assessment of practical skills in Clinical Physiology : Perceptions of medical students and faculty.(Accepted in Scripta Medica Manuscript ID#35975)

Anesthesia Publications

39. S Das, AK Patra, Amit Tak. Regional Block Analgesia in Trauma patient: Transfer of trauma patient from peripheral hospital to tertiary care Centre. ANESTHESIA AND ANALGESIA 133 (3 S_ SUPPL), 1693-1693