

Curriculum Vitae

Dr. Pushan Bharadwaj

*MBBS, DRM, DNB, CCST(Nuc Med-UK), FRCP(Edin), MSc (Cardiology-UK) DCBNC(USA),
FEBNM, FASNC(USA), FIAMS, CCD(USA)*

Dr. Pushan Bharadwaj

Personal details

Address:	4 Pinnacle Apt, 6 Maxwell Road Northwood HA6 2YF
Telephone:	+447940155783 (Mobile)
National Insurance Number:	PX 021712 A
Email address:	pushanb@gmail.com
General Medical Council Reg	4774191, 17 th January 2001
CCST (Nuclear Medicine)	Certified on 8 th October 2001
WBMC (India) Registration	48389 dated 26 th February 1991

Academic and professional qualifications

2019	Certified Clinical Densitometrist International Society of Clinical Densitometry, USA
2013	MSc in Cardiology University of Brighton, UK
2009	Fellow of ASNC American Society of Nuclear Cardiology
2009	Fellow of EBNM European Board of Nuclear Medicine
2007	Diplomate of CBNC Certification Board of Nuclear Cardiology (USA)
2006	FRCP (Edinburgh) Royal College of Physicians, Edinburgh
2001	UK CCST (Nuclear Medicine) STA of the Medical Royal Colleges
1996	Diplomate of NBE (Nuclear Medicine) National Board of Examinations, India
1994	Diploma in Radiation Medicine Radiation Medicine Centre, BARC, India
1990	MBBS (First Class) Medical College & Hospital, India

Career summary

I have worked for over 25 years as a consultant in Nuclear Medicine in diverse set-ups across the globe with a vast experience in most diagnostic and therapeutic aspects. After graduation from Kolkata, I completed my post graduate training in Mumbai and London and obtained a single-handed consultant's position in Scotland in 2001. I am a fellow of the Royal College of Physicians Edinburgh and I hold a master's degree in Cardiology from the University of Brighton, UK. I also had the unique privilege of running a rapid access chest pain clinic in Scotland between 2006 and 2011, when I developed a special interest in cardiac imaging.

I am an enthusiastic and passionate teacher. I was actively involved in both undergraduate and post graduate education in Singapore, having received an Outstanding Faculty (Residency) award from the Radiological Sciences Division of our hospital in 2019. I was involved in research and audits in my previous posts including the Singapore General Hospital where I worked from September 2015 to July 2023.

Awards

2020	Covid Warrior award for full time voluntary work amongst the Covid affected/suspected overseas workers in Singapore in May/June 2020
2019	Outstanding Faculty (Residency) award by the Radiological Sciences Division of SGH for dedication and excellence in teaching
1989	Annual Merit Scholar in MBBS for securing a position among first 5 students, University of Calcutta, India
1984	Chief Minister's Award , for being placed 11th in the order of merit in Higher Secondary Examination (among 270,000 students)
1984	National Merit Scholar , Higher Secondary Examination, India
1982	Governor's Award , for being placed 6th in the order of merit in Secondary Examination (among 300,000 students)
1982	National Merit Scholar , Secondary Examination, India

Professional memberships

Royal College of Physicians, Edinburgh

Society of Nuclear Medicine, India

Association of Nuclear Medicine Physicians of India

Nuclear Cardiological Society of India

World Association of Radiopharmaceutical and Molecular Therapy

Current appointment (from 14/08/2023)

I am presently working as a consultant in the department of Nuclear Medicine at the Royal Brompton and Harefield Hospitals under the Guy's and St Thomas' NHS Foundation Trust.

Previous appointments in Nuclear Medicine

Senior Consultant
(01/09/2015 to 29.07.2023)

Dept of Nuclear Medicine & Molecular imaging
Singapore General Hospital, Singapore

Consultant and Head
(13/09/2012 to 31/07/2015)

Department of Nuclear Medicine and PET-CT
Apollo Gleneagles Hospital, Kolkata, India

Consultant and Head
(02/05/2011 to 31/08/2012)

Department of Nuclear Medicine and PET-CT
PD Hinduja National Hospital, Mumbai, India

**Consultant and Head and
Honorary Lecturer, Aberdeen Uni.**
(11/06/2001 to 28/05/2011)

Department of Nuclear Medicine
Raigmore Hospital, Old Perth Road
Inverness IV2 3YW, Scotland, United Kingdom

Specialist Registrar
(09/09/98 to 08/06/01)

Joint Department of Nuclear Medicine
Royal Marsden and Royal Brompton Hospital
Sydney Street, London SW3 6NP, UK

Visiting Specialist Registrar
(23/04/98 to 08/09/98)

St. Bartholomew's Hospital
West Smithfield, London EC1A 7BE

Consultant in Nuclear Medicine
(18/3/96 to 16/04/98)

**Radiation Medicine Centre (RMC), Bhabha
Atomic Research Centre, Mumbai, India**

Senior Registrar
(17/11/94 to 16/03/96)

**Sanjay Gandhi Post Graduate Institute
of Medical Sciences (SGPGI), Lucknow, India**

Clinical Research Fellow
(16/08/94 to 15/11/94)

Regional Radiation Medicine Centre,
Calcutta, India

**Post Graduate Trainee
in Nuclear Medicine**
(02/08/93 to 31/07/94)

**Radiation Medicine Centre,
Bhabha Atomic Research Centre,**
Mumbai, India

Previous appointments in General Medicine

Medical officer, ICU (Medical)
(01/02/92 to 31/07/93)

SVSM Hospital, Calcutta, India

**Resident House Physician
Cardiovascular Surgery**
(01/08/91 to 31/01/92)

Medical College and Hospitals,
Calcutta, India
(2000 bedded teaching hospital)

**Resident House Physician
In General Medicine**
(01/02/91 to 31/07/91)

Medical College and Hospitals
Calcutta, India

**Resident House Physician
Cardiology**
(01/08/90 to 31/01/91)

Medical College and Hospitals
Calcutta, India

**Preregistration
House Officer (Intern)**
(01/08/89 to 31/07/90)

Medical College and Hospitals
Calcutta, India

Clinical experience

1. Experience in Internal Medicine and Cardiology

I had over 3 years of experience in Internal Medicine and Cardiology in a busy academic institution in India prior to joining Nuclear Medicine. I handled all types of medical emergencies including acute cardiac events, having performed emergency cardiopulmonary resuscitation, elective cardioversion, temporary pacing and elective right heart catheterization. As a consultant in nuclear medicine in UK (2001-2011), I was also the lead physician in charge of the Rapid Access Chest Pain Clinic in collaboration with the Department of Cardiology at Raigmore Hospital, Inverness. I hold a master's degree in Cardiology from the University of Brighton, UK

2. Experience in General Nuclear Medicine and Therapy

I am familiar with most of the routine diagnostic and therapeutic procedures in nuclear medicine with 25 years of experience after post-graduation in the specialty. Radiation Medicine Centre, where I trained from, is the oldest nuclear medicine institute in India, offering postgraduate training to physicians as well as technologists. Besides routine nuclear medicine services, it has the largest comprehensive thyroid clinic of the country. In Singapore, I gained a substantial experience in therapeutic nuclear medicine, including Lutetium-177 therapy for neuroendocrine tumours and prostate cancer, Y-90 therapy for Hepatocellular carcinoma, 223 Radium therapy for bone metastases, amongst others.

3. Experience in PET/PET-CT

Since 2011, I have been involved with the regular conduction and reporting of PET-CT studies for various applications in the field of Oncology, Cardiology and Neurology. Earlier, I went to the University Hospital in Zurich for a two-week fellowship in PET-CT in 2006. I have attended several workshops, seminars and teaching courses in PET-CT in various reputed centres in and outside UK. In Singapore, we performed around 25 PET scans every day.

Teaching experience

As a Consultant in Singapore and India: SGH is the largest tertiary care teaching hospital in Singapore and associated with the Duke-NUS and YLL-NUS schools of medicine. I was an honorary clinical assistant professor for the former and clinical senior lecturer for the latter, undertaking regular teaching of the undergraduate students from both colleges. As a Clinical Core Faculty member for both Nuclear Medicine and Radiology Residency Programs, I was intimately associated with post graduate teaching and training in my previous position.

PD Hinduja Hospital is an accredited hospital for teaching by the National Board of Examinations, India and I was a National Board approved teacher, and I was involved in the teaching of students on a regular basis, both at a postgraduate and an undergraduate level.

As a Consultant in UK: Specialist Registrars in Cardiology and Radiology trained under me regularly between 2001 and 2011. I was also involved in regular teaching of 4th year medical students from Aberdeen who rotated through our department. I also took a tutorial on management of thyroid diseases for the students. I regularly taught nurses, technicians, radiographers and physicists.

As a Registrar in UK: I was involved in both formal and informal teaching as a registrar during my tenure and this comprised faculty members of other specialties, specialist registrars of different hospitals who rotated through the Royal Brompton Hospital, visiting national and

international specialists in nuclear medicine and cardiology, medical students, radiography students, nurses in training and in practice and physicists in training.

As Scientific Officer in India: As a permanent faculty member of RMC, I was assigned the responsibility of teaching cardiovascular nuclear medicine for the students registered for the PG Diploma under University of Bombay. Regular apprenticeship of students at my thyroid clinic was a part of the institute's teaching curriculum. I had an extensive experience in teaching both medical and non-medical faculty as a part of the ongoing continuing medical education programme of the parent institute Bhabha Atomic Research Centre.

Research and Publications

My involvement in research dates to my tenure as a post graduate trainee at two leading teaching institutes in Nuclear Medicine of India. I had undertaken several research projects both at **SGPGI** and at **RMC**. As a teacher at **RMC**, I worked as coinvestigators in supervising trainees in their **dissertation work**. I was involved in research as a specialist registrar at the Royal Brompton Hospital in London. I gained considerable theoretical knowledge in research methods and critical appraisal through my formal **MSc** training in Cardiology. Also, I had to submit a dissertation which was peer reviewed and revised before acceptance.

At **SGH**, I was involved in a few research projects; one looking at the serial bone mineral density measurement of Asian patients before and after renal transplantation over a period of 5 years. In another, we looked at the adaptations that we made in our nuclear cardiology services following the recent Covid pandemic.

Singapore General Hospital has a strong emphasis in clinical governance and quality. I have been involved in a few audits and quality improvement projects undertaken by our resident trainees.

1. Peer reviewed journal publications

1. **Comparison of Equilibrium Radionuclide Ventriculography with CMR for Assessing the Systemic Right Ventricle after Mustard or Senning Procedures for Complete Transposition of the Great Arteries.** Hornung T, Anagnostopoulos C, Bharadwaj P, et al. American Journal of Cardiology 2003; 92: 640–643
2. **Current Status and Growth of Nuclear Theranostics in Singapore.** Huang HL, Tong AKT, Bharadwaj P, et al. Nuclear Medicine and Molecular Imaging 2019. April; 53(2): 96-101
3. **Addressing bone quality and bone density after renal transplantation: A prospective evaluation of the evolution of trabecular bone score and bone mineral density over the first 5 years following renal transplantation in Asian patients.** Chandran M, Hao Y, Bharadwaj P. Clinical Transplantation July 2019; 33(10): e13671
4. **Adapting to a novel disruptive threat: Nuclear Cardiology Service in the time of the Coronavirus (COVID-19) Outbreak 2020 (SARS reboot).** Kelvin S. H. Loke, Wei Ying Tham, Pushan Bharadwaj, et al. Journal of Nuclear Cardiology, 2020 June;27(3):1005-1009
5. **A historic review of the discovery of the medical uses of radioiodine.** Barbara Hertz, Pushan Bharadwaj and Bennett Greenspan. Pak J of Nuclear Medicine, 2020; 10(1): 60-63
6. **Multimodality Imaging in the Diagnosis and Assessment of Cardiac Amyloidosis.** J Velaga, C Liew, A Poh, PT Lee, N Lath, SC Low and Pushan Bharadwaj. World J Nuclear Medicine 2022; 21:173–183.

2. Book Chapters

1. First author of the chapter titled “**Nuclear medicine in heart failure**” in the “**Text book of heart failure**” published by the Oxford University Press in 2011 (1st edition) and 2022 (2nd edition).
2. Sole author of the chapter titled “**Diagnostic techniques in Cardiology: Nuclear Medicine**” in **Clinical Cardiology**, Ed: Dr Indranill Basu Ray, 2016, published by Paras Medical Publisher, Hyderabad, India

3. Abstracts and presentations

1. **99m-Tc- sulphur colloid uptake in normally functioning renal allograft.** Is this study useful at all in evaluation of transplant dysfunction? Bharadwaj P, Gupta A, Bhushan S (Indian Journal of Nuclear Medicine, IJNM, October 1996)
2. **Peritoneoscintigraphy with 99m-Tc-sulphur colloid in patients on chronic ambulatory peritoneal dialysis**, a pilot study. Bharadwaj P, Bhushan S (IJNM, Oct 1996)
3. **Dobutamine TI 201 myocardial perfusion scintigraphy:** Initial experience in 25 patients and comparison with physiological stress on a bicycle. Hafizunnisa, Bharadwaj P, Nair N (IJNM, July 1996)
4. **Utility of reinjection of TI201 at 24hrs in patients showing persistent defects at 4 hrs.** Bharadwaj P, Goel V, Nair N (IJNM, Oct 1996)
5. **99m-Tc-Tetrofosmin in primary bone tumours.** A pilot study. Bharadwaj P, Santhily.N, Manglani H, Nair CN, Nair N (IJNM, Oct 1997)
6. **Dual isotope rest TI201 and stress 99m-Tc-Tetrofosmin study** in patients with history of myocardial infarction. Bharadwaj P, Chakraborty B, Patel R, Nair N (IJNM, Oct 1997)
7. **Full bladder 99m-Tc-MAG3 renal scintigraphy in neuropathic bladders: methodology** Nagabhushan N, Syed R, Bharadwaj P, Bomanji J, et al. Nuclear Med Communications April 2002; 23(4): 389-390
8. **Addressing Bone Quality Loss After Renal Transplantation.** A Systematic Assessment of the Evolution of Trabecular Bone Score (TBS) over the first one (expanded to five) year following renal transplantation and its correlation with Bone Biochemical Parameters and Steroid Use in Asian Patients: **Chandran M, Hao Y, Kwee A, Swee DS, Ng D, Bharadwaj P**; Annual meeting of the American Society of Bone and Mineral Research held 8th to 11th October 2017 at Denver, Colorado, USA

Invited lectures (selected)

11th Annual Meeting of the Balkan Congress of Nuclear Medicine, Skopje, Republic of North Macedonia, 30th May to 2nd June 2024: Cardiac PET in infection and inflammation

25th Annual Conference of the Society of Nuclear Medicine in Indonesia, Surabaya, Indonesia, 25th – 26th August 2023: Two talks

1. Viability studies in Nuclear Medicine
2. The current use of MUGA in the assessment of LV function

24th Annual Conference of the Society of Nuclear Medicine in Indonesia, Yogyakarta, Indonesia, 7th – 8th October 2022: Does ISCHEMIA matter?

35th Annual Convention of the Philippine Society of Nuclear Medicine, Manila, Philippines, 1-2 February 2020: A comparison between functional stress tests and CT angiography in chronic coronary syndromes

20th Anniversary Meeting of the Cyprus Society of Nuclear Medicine, Limassol, Cyprus, 6th-10th November 2019: Myocardial Perfusion Imaging: why do we need PET and What is the evidence of Nuclear Viability Testing

23rd Annual Scientific Meeting of the Indonesian Society of Nuclear Medicine and Indonesia Nuclear Expo 2019, Yogyakarta, Java, Indonesia, 6th-7th September 2019: Structured Reporting of Myocardial Perfusion Imaging

13th Biennial Meeting of the Asia Oceania Federation of Nuclear Medicine and Biology, Shanghai, China, 9th to 12th May 2019: Evidence base of nuclear viability testing

6th Annual Meeting of the Pakistan Society of Nuclear Medicine, Karachi, Pakistan, 6th – 9th December 2018: Nuclear Viability testing: current issues and Myocardial Perfusion Imaging: why do we need PET?

1st Nuclear Cardiology Workshop, Indonesian Society of Nuclear Medicine, Bandung, Indonesia, 1st and 2nd December, 2018: A series of lectures on SPECT and PET myocardial perfusion imaging

22nd Annual Scientific Meeting of Indonesian Society of Nuclear Medicine (ISNM), Bandung, Indonesia, 14th – 16th September 2018: Workshop in Nuclear Cardiology: Hands On: Pitfalls, Reconstruction, Interpretation and Reporting of PET & SPECT MPI

7th Balkan Congress of Nuclear Medicine, Sarajevo, Bosnia and Herzegovina, 9th – 12th May 2018: Courage, Faith, Ischemia and Death

23rd National Conference of Society of Nuclear Medicine Bangladesh, Khulna, Bangladesh, 16th – 18th February 2018: Nuclear Imaging in Cardiac Amyloidosis

6th Annual Congress of the Balkan Society of Nuclear Medicine, Sofia, Bulgaria, 20th – 23rd April 2017: Myocardial viability: Squabbles and controversies

Advances in Gynaecological and Prostate malignancies, MRCCC, Siloam Hospitals, Jakarta, Indonesia, 25th February, 2017: PET Imaging in prostate cancer

Annual Conference of the Indian Radiological and Imaging Association, West Bengal Chap, Kolkata, 11th-12th Nov, 2016: Nuclear Imaging of Prostate Cancer: beyond a bone scan

Update in Cardiology 2014, Cardiological Society of India – West Bengal Chapter: 18th and 19th October 2014: Myocardial viability and hibernation, radionuclide techniques of assessment

19th National Conference of the Society of Nuclear Medicine, Bangladesh, Cox's Bazar, Bangladesh, 26th to 29th March 2014: Clinical PET-FDG and beyond.

18th Annual conference of the Family Physician's Association of Kolkata, Kolkata, 4th and 5th January 2014: Clinical PET: what does a general practitioner need to know

8th International Conference on Radiopharmaceutical Therapy, Manila, Philippines, 17th to 21st November 2013: Preconference Nuclear Cardiology symposium: Imaging in non-acute chest pain: choosing the right test

9th Biennial Conference of Nuclear Cardiological Society of India, Chennai, India, 25th to 27th October, 2013: Myocardial viability: squabbles and controversies

19th Annual Congress of the Indian Society of Critical Care Medicine (Criticare 2013), Kolkata, March 2013: Role of Nuclear Medicine in an acute setting

Bangur Institute of Neuroscience and Psychiatry, Calcutta, India, August 2007: Role of Nuclear Medicine in movement disorders

Society of Nuclear Medicine, India, Eastern Chapter at the Eko Xray & Imaging Centre, Calcutta, India, August 2007: Dopamine Transporter Imaging in clinical practice

Dept of Medicine, Western Isles Hospital, Stornoway, Scotland: April 2006: Nuclear Medicine in movement disorders

Eko Xray & Imaging Centre, Calcutta, India, March 2005: Role of regional cerebral blood flow SPECT in psychiatry

Department of Radiology, Aberdeen Royal Infirmary: December 2004: Myocardial perfusion scintigraphy: how and when?

New Craigs Hospital July 2003: Role of Cerebral blood flow studies in Psychiatric disorders

College of the Radiographers at the City University London, March 2001: Essentials of Nuclear Cardiology

College of the Radiographers at the City University London in November 2000: Clinical applications of lung scintigraphy

National workshop on Nuclear Medicine in Oncology, Regional Cancer Centre, Trivandrum, India, February, 1997: Nuclear medicine in managing patients with cancer

International workshop on bone tumours, Tata Memorial Hospital, Bombay, India, December, 1996: Role of nuclear medicine in the management of primary bone tumours

Future aspirations

I have a special interest in cardiac imaging in general and nuclear cardiology in particular. Because of my active involvement in a rapid access chest pain clinic in Inverness, Scotland, I decided to enrol for an MSc degree in Cardiology from the University of Brighton. I have also attended training courses in cardiac PET and cardiac CT imaging conducted by IAEA and the American Society of Nuclear Cardiology and practising all aspects of cardiac PET imaging.

Currently we provide a comprehensive cardiac imaging service to patients from not only the local and national hospitals in the UK but from across the world who consult the cardiac and respiratory physicians at the Royal Brompton and Harefield Hospitals. This includes Myocardial perfusion scanning involving both SPECT and PET (Rubidium 82), Amyloid Imaging of the heart using Tc-DPD, Sarcoid imaging of the heart with sequential resting Rubidium perfusion and FDG imaging, Infection and inflammation of the heart and various cardiac devices, using FDG imaging.

I would like to be involved in quality research using PET tracers for amyloid imaging, Fluorine-18 labelled myocardial perfusion tracers and tracers for inflammation/fibrosis imaging of the lung.

General Interests and hobbies

History and heritage: In the recent years I have developed a keen interest in studying local history and heritage. In Singapore, I organised heritage tours of various historic precincts for the local enthusiasts, on a purely voluntary basis.

Trekking: From my college days, I have been walking in the Himalayas. I used to walk in the Highlands regularly.

Photography: Over the last couple of decades, I have developed a passion for photography. I enjoy nature photography most and my photographs have been published internationally.

Music: I am a keen follower of both Indian and Western Classical Music. I play the Harmonica. I have won several prizes in vocal music competitions at school and college levels.

Referees

1. Dr David Ng MBBS MRCP (UK) FRCP (Edin) BSc MSc FAMS
Senior consultant, Dept of Nuclear Medicine and Molecular Imaging
Singapore General Hospital, Outram Road, Singapore 169608

Tel: +65 6321 3747 **Mobile:** +65 92391916 **Email:** david.ng.c.e@singhealth.com.sg

2. Dr Stephen Leslie BSc MB ChB FRCP PhD
Professor in Cardiology, Raigmore Hospital, Inverness IV23UJ, UK
Tel: +44 1463705462 **Mobile:** +44 7734226227 **Email:** stephen.leslie@nhs.scot