

Mr. Vijay Joshi

MBChB, FRCSEd (C-Th), PGCert Medical Law

Email: vijayjoshi@doctors.net.uk

Mob: 07870135795

Nationality: British / Canadian

Website: www.thoracicexpertwitness.co.uk/

Summary

I am a U.K. and U.S. trained cardiothoracic surgeon with a focus on general thoracic surgery and thoracic oncology. I am currently a consultant at Wythenshawe Hospital with Manchester University NHS Foundation Trust in South Manchester, United Kingdom. I have completed licencing exams for both the U.S and Canada and I am on the Canadian medical register through the Medical Council of Canada.

My clinical practice is in VATS lobectomy, pleural surgery (including effusions, empyema, and pneumothorax), mediastinal masses, diaphragm palsy and hernia, chest wall tumours, lung volume reduction for emphysema, airway procedures, and both elective and emergency general thoracic surgery, including trauma. I have had additional specialist experience in ECMO, mesothelioma, pectus surgery, and upper gastrointestinal surgery throughout my training.

My research has been focused in lung cancer, pneumothorax, minimally invasive techniques (VATS) and new technology, mesothelioma, robotics, thymic surgery, ECMO, diaphragmatic hernia, wound infections, trauma, teaching and training, airway interventions, and post-operative complications following thoracic surgery.

I also have a strong interest in law and have completed a Postgraduate Certificate in medical law with Northumbria University Law School. I am currently a student-at-law, undertaking my LL.B (Hons) part-time at Nottingham Law School. I have also completed the Bond Salon course and have been awarded a Civil Expert Certificate. I have completed training as a mediator on a CMC accredited course.

Professional Qualifications

Current Appointment

Consultant Thoracic Surgeon, Manchester University Foundation Trust, Wythenshawe Hospital. Appointed: January 2019

Responsibilities and Leadership Roles

Management of a busy surgical practice

Development and application of new departmental policy

Investigations into complaints or events where patients have come to harm

Education, mentoring and training of students and trainees

Audit of performance outcomes and implementation of new practice directions

Supervisory role in research

Chair of High-Risk Tumour Board / Multi-Disciplinary Team meetings

Co-surgical lead in Lung Volume Reduction Surgery

Co-developer and primary webmaster for our departmental website

[\(https://mft.nhs.uk/wythenshawe/services/lung-cancer-and-thoracic-surgery/\)](https://mft.nhs.uk/wythenshawe/services/lung-cancer-and-thoracic-surgery/)

Professional Memberships

General Medical Council (6163569, full registration)

Canadian Medical Register (120957)

Medical Protection Society (326054, with medico-legal cover)

ECFMG Certification (07211519)

Royal College of Surgeons of Edinburgh

Society for Cardiothoracic Surgery in Great Britain and Ireland

Manchester and District Medico-Legal Society

Ontario Bar Association

Additional Degrees / Qualifications

LL. B (Hons), Nottingham Law School (current)

Completed two mini-pupillages in criminal law under barrister(s) Mr. Arif Ashraf (defence) and Ms. Vanessa Thomson (prosecution) in Manchester 2019, having both times attended Crown Court.

Mediation training (Civil & Commercial, Workplace) completed under National Dispute Resolution (CMC accredited) 2020

Post Graduate Certificate in Medical Law, Northumbria University (2018)

U.S. Medical Licencing Exams (Steps 1, 2, & 3, 2015)

Canadian Medical Qualifying Exams (Evaluating Exam, Parts 1 & 2, 2013)
Scored in 97th percentile on the Evaluating Exam

Fellowships

Robotics Fellowship, James Cook University Hospital (Aug 2018, 6 months), under Mr. Joel Dunning FRCS

Advanced General Thoracic Surgery, Mayo Clinic, Rochester USA. Aug 2016-2018 (2 years), under Mark Allen MD, Stephen Cassivi MD, Dennis Wigle MD PhD, Shanda Blackmon MD, Robert Shen MD, and Frances Nichols MD

University of Toronto, Department of Thoracic Surgery, Toronto General Hospital, Canada, (Observership) under Gail Darling MD, June 2013

Specialist Training

National Trainee in Cardiothoracic Surgery: East Midlands Deanery (2018)

Medical School

MBCChB. University of Liverpool. Graduated July 5, 2007

Awards

Above and Beyond award winner. Mayo Clinic, Rochester USA. April 2017.
Awarded for exceeding expectations and exemplifying Mayo Clinic's mission and vision.

Nomination for Young Investigator Award for work entitled "Early Prosthetic Valve Degeneration with Mitroflow Aortic Valves: Determination of Incidence and Risk Factors." European Association for Cardiothoracic Surgery annual meeting. Vienna, Austria. Oct 8, 2013

Gold Award winner. North Western deanery school of surgery. Sep 1, 2010.
Awarded for achievements in surgical training

Professor Robert Roaf Scholarship prize winner. University of Liverpool. 2005.
Awarded for achievements during surgical elective

Training History

Higher Surgical Training (Aug 2011 – Aug 2018)

ST8/OOPT. 2 Year Fellowship: Advanced General Thoracic Surgery, Mayo Clinic

ST7. General Thoracic Surgery, Nottingham City Hospital under Mr(s) Andrew Thorpe and John Duffy

ST6. General Thoracic Surgery and Congenital Cardiac Surgery, Glenfield Hospital, Leicester under Mr(s) Sridhar Rathinam and Attilio Lotto

ST6. Adult Cardiac Surgery. Glenfield Hospital, Leicester under Professor(s) Gavin Murphy and Giovanni Mariscalco

ST5. General Thoracic Surgery. Glenfield Hospital, Leicester under Mr(s) David Waller and Sridhar Rathinam

ST3 and ST4. Adult Cardiac Surgery. Nottingham City Hospital under Mr. David Richens

ST3. General Thoracic Surgery. Glenfield Hospital, Leicester under Mr(s) David Waller and Apostolos Nakas

Core Surgical Training (Aug 2009 – Aug 2011)

CT2. Cardio-Thoracic Surgery, Blackpool Victoria Hospital under Mr. Joseph Zacharias

CT1. Adult Cardiac Surgery. University Hospital of South Manchester under Mr. Ben Bridgewater

CT1. General / Colorectal Surgery. University Hospital of South Manchester under Ms. Karen Telford

Foundation Training (Aug 2007 – Aug 2009)

F2. Family Medicine. Weavervale Practice, Liverpool under Dr. Richard Frood

F2. Trauma and Orthopaedic Surgery. Warrington Hospital under Mr. Ashutosh Acharya

F2. General / Vascular Surgery. Warrington Hospital under Mr. Tom Nicholas

F1. Gastroenterology / Internal Medicine. Warrington Hospital under Dr. Subramanan Ramakrishnan

F1. General / Vascular Surgery. Warrington Hospital under Mr. Tom Nicholas

F1. Paediatric Surgery. Royal Liverpool Children's Hospital under Mr. Colin Bailey

Presentations

As Invited Lecturer

Joshi V. Lung Volume Reduction Surgery. Webinar hosted by Pulmonix (April 2021)

Joshi V. Lung Cancer Resection techniques - What the Radiologist Should Know. British Society of Thoracic Radiologists. Edinburgh (Nov 2019)

Joshi V. Implementing New Innovations and Technology in Surgery: Minimising Risk and Maximising Safety. Manchester and District Medico-legal Society. Manchester (Oct 2019)

Lectures on Cardiothoracic Training Program North-western Deanery (given annually)

Oesophageal Surgery for the FRCS exam, Lung Volume Reduction Surgery, Medico-legal issues in Surgery

Regional Presentations

Case Presentation: Joshi V, Rathinam S. Chest Wall Resection and Reconstruction for Rosai-Dorfman Disease Masquerading as a Chest Wall Sarcoma. Midlands Cardiothoracic Meeting. Leicester. Mar 11, 2015

Dobra R, Watts H, Joshi V, Basu R. Audit on the use of Beta-blockers post Cardiac Surgery. Midlands Cardiothoracic Meeting. Coventry. Mar 8, 2013

Joshi V, Nakas A, Waller DA, Harvey C, Peek G, Firmin R. The need for Thoracic Surgery in Adult Patients Receiving Extra Corporeal Membrane Oxygenation: a 16 year Experience. Midlands Cardiothoracic Meeting. Stoke. Mar 16, 2012

Tsitsias, T. Joshi V, Nakas A, Waller DA. The use of Laser Ablation as a Bridge to Subsequent Resection in Malignant Airway Obstruction. Midlands Cardiothoracic Meeting. Stoke. Mar 16, 2012

Joshi V, Kirmani B, Zacharias J. Thoracotomy versus VATS: Is There an Optimal way to Treat Pneumothorax? Midlands Cardiothoracic Meeting. Nottingham. Sep 09, 2011

Joshi, V. Olojugba D. Audit of Abdominal Aortic Aneurysm Surveillance List. Warrington Hospital surgical audit meeting. Feb 17, 2009.

Joshi V, Thekkudan J, Griffiths EM. Postoperative Coagulopathy in the Cardiac Surgical Patient. Liverpool Heart and Chest Hospital audit meeting. Sep 2006.

Case Presentation: Joshi V. An Unconscious Patient. Presented at an A&E teaching session. Whiston Hospital. Sep 2006.

National Presentations

M Taylor, F Abouelela, R Shah, P Krysiak, K Rammohan, E Fontaine, V Joshi, F Granato. A contemporary experience of surgical and endobronchial lung volume reduction procedures. Society for Cardiothoracic Surgery in Great Britain and Ireland 2021 meeting.

M Taylor, R Shah, P Krysiak, K Rammohan, E Fontaine, V Joshi, F Granato. A single-centre contemporary experience of outcomes for patients with oligometastatic lung cancer undergoing thoracic resection. Society for Cardiothoracic Surgery in Great Britain and Ireland 2021 meeting.

T. Eadington, M. Taylor, R. Shah, P. Krysiak, K. Rammohan, E. Fontaine, F. Granato, V. Joshi, R.V. Venkateswaran, J. Barker. A single-centre experience of patients undergoing thoracic surgery whilst established on veno-venous extracorporeal membrane oxygenation (VV-ECMO). Society for Cardiothoracic Surgery in Great Britain and Ireland 2021 meeting (poster).

Salmasi MY, Joshi V, Vaja R, Faulkner G, Harvey C. Mobile Extra-Corporeal Membrane Oxygenation in Paediatric Patients: Three Year Experience from a Specialist Centre. Society for Cardiothoracic Surgery in Great Britain and Ireland annual meeting, Birmingham 2015.

Joshi V, Harris E, Qureshi M, Addae-Boateng E, Majeswki A, Thorpe JA, Duffy JP. The Importance for Continued Thoracic Surgical input in the Surgical Management of

Oesophageal Cancer. Society for Cardiothoracic Surgery in Great Britain and Ireland annual meeting, Birmingham 2015.

Asenmota N, Joshi V, Addae-Boateng E, Thorpe JA, Duffy JP, Majeswki A. Benefits to using Pre-made Buttressed Staples in Lung Volume Reduction Surgery. Society for Cardiothoracic Surgery in Great Britain and Ireland annual meeting, Birmingham 2015 (poster).

Monaghan A, Joshi V, Oey I, Rathinam S. The use of Tissue Patch to Reduce the Duration of Air Leak Following Lung Volume Reduction Surgery. World Society of Cardiothoracic Surgeons, Edinburgh Sep 2015.

Paik A, Joshi V, Rathinam S. Video Assisted Thoracoscopic Removal of a Mediastinal Mass using LigaSure Vessel Sealer. World Society of Cardiothoracic Surgeons, Edinburgh Sep 2015.

Vaja R, Joshi V, Porter R, Faulkner G, Harvey C. Five-Year Experience with Mobile Adult ECMO in a Tertiary Referral Centre. Society for Cardiothoracic Surgery in Great Britain and Ireland annual meeting, Manchester 2015.

Boulemden A, Ang K, Joshi V, Nakas A, Waller DA. The Case for “Anatomical Sublobar Resection” for all Stage I Non-Small Cell Lung Cancer. European Society of Thoracic Surgeons annual meeting. Society for Cardiothoracic Surgery in Great Britain and Ireland annual meeting, Edinburgh 2014.

Joshi V, Vaja R, Dawson A, Waller D. Is diagnostic VAT thymectomy an acceptable first-line approach to the suspicious mediastinal mass? Society for Cardiothoracic Surgery in Great Britain and Ireland annual meeting, Edinburgh 2014.

Joshi V, Richens D. Cost Analysis on the Potential Benefit of Gentamicin Impregnated Collagen Sponges in Preventing Sternal Wound Infection Post Cardiac Surgery. Society for Cardiothoracic Surgery in Great Britain and Ireland annual meeting, Edinburgh 2014.

Dawson AG, Joshi V, Waller D. Excision of the primary end stage 4 non-small cell lung cancer: A feasibility study. Society for Cardiothoracic Surgery in Great Britain and Ireland annual meeting, Edinburgh 2014

Sharkey AJ, Joshi V, Vaja R, Nakas A, Waller DA. The Importance of Accurate Pre-operative Biopsy in the Radical Management of Mesothelioma: Don't Blame the Physician, just keep taking more bites. Society for Cardiothoracic Surgery in Great Britain and Ireland annual meeting, Edinburgh 2014.

Joshi V, Nakas A, Waller DA, Harvey C, Peek G, Firmin R. The need for Thoracic Surgery in Adult Patients Receiving Extra Corporeal Membrane Oxygenation: a 16 year Experience. Society for Cardiothoracic Surgery in Great Britain and Ireland annual meeting. Manchester 2012.

Joshi V, Bilal RH, Bittar MN. Horner's Syndrome Following VATS Lung Biopsy: A Rare Complication. Royal Society of Medicine; cardiothoracic section annual meeting. London 2011 (poster).

Joshi V, Bridgewater B. Secondary Prevention Following Coronary Artery Bypass Grafting: Are we Compliant with the Guidelines? Society for Cardiothoracic Surgery in Great Britain and Ireland annual meeting. London 2011.

Kirmani B.H, Joshi V, Zacharias J. Is Open Pleurectomy the Best way to Manage Pneumothorax? A Contemporaneous Comparative Study. Society for Cardiothoracic Surgery in Great Britain and Ireland annual meeting. London 2011.

Devbhandari M, Joshi V, Shah R, Jones MT. Implications of Lung Cancer Waiting Time Targets for Thoracic Surgeons in the UK. Society for Cardiothoracic Surgery in Great Britain and Ireland annual meeting. Liverpool 2010.

Joshi V, McShane J, Soorae A, Page R, Carr R, Mediratta N, Shackcloth M, Poullis M. Clinical Upstaging Of Non-Small Cell Lung Cancer That Extends Across The Fissure: Implications For The Current TNM Classification System. Society for Cardiothoracic Surgery in Great Britain and Ireland annual meeting. Edinburgh 2008.

International Presentations

Joshi V, Rose P, Blackmon SH. Prone Aortic Segmental Mobilization for Spine Stabilization and Vertebra Removal through a VATS approach. American Association of Thoracic Surgeons. Boston, May 2017 (video)

Joshi V, Rose P, Wigle D. Removal of Chondrosarcoma of the Chest Wall in Close Proximity to the Spine. General Thoracic Surgical Club. Florida, March 2017 (poster)

Vaja R, Sharkey A, Joshi V, Harvey C. Should Neonates with Severe Congenital Diaphragmatic Hernia be Given the Option of ECMO? European Society of Thoracic Surgeons annual meeting. Naples, May 2016.

Salmasi Y, Joshi V, Vaja R, Faulkner G, Harvey C. Mobile Extra-Corporeal Membrane Oxygenation in Paediatric Patients: 3 Year Experience from a Specialist Centre. International Congress on ECMO and short-term circulatory/respiratory support. Paris, June 2015.

Vaja R, Joshi V, Faulkner G, Porter R, Harvey C. 5-Year Experience with Mobile Adult ECMO in a Tertiary Referral Centre. European Society of Thoracic Surgeons annual meeting. Lisbon, May 2015.

Ismail N, Vaja R, Joshi V, Nakas A, Waller D, Rathinam S. Audit of Trauma Practice in a Tertiary Referral Thoracic Surgical Centre in the UK. European Association for Cardiothoracic Surgery annual meeting. Milan, Oct 2014.

Vaja R, Joshi V, Dawson A, Waller D. Is diagnostic VAT thymectomy an acceptable first-line approach to the suspicious mediastinal mass? International Thymic Malignancy Interest Group annual meeting. Belgium, Sep 2014. (poster)

Joshi V, Prosser K, Richens D. Early Prosthetic Valve Degeneration with MitroFlow Aortic Valves: Determination of Incidence and Risk Factors. European Association for Cardiothoracic Surgery annual meeting. Vienna, Oct 2013.

Boulemden A, Ang K, Joshi V, Nakas A, Waller DA. The Case for “Anatomical Sublobar Resection” for all Stage I Non-Small Cell Lung Cancer. European Society of Thoracic Surgeons annual meeting. Essen, June 2012.

Tsitsias, T. Joshi V, Nakas A, Waller DA. The use of Laser Ablation as a Bridge to Subsequent Resection in Malignant Airway Obstruction. European Society of Thoracic Surgeons annual meeting. Essen, June 2012 (poster).

Joshi V, Harvey C, Nakas A, Waller DA, Peek G, Firmin R. Thoracic Surgery in Adult Patients Receiving Extra Corporeal Membrane Oxygenation (ECMO): A 16 Year Experience. European Society of Thoracic Surgeons annual meeting. Essen, June 2012.

Joshi V, Tack G, de Ramon A. Collins A. Intercostal Chest Drain (ICD) Insertion: Knowledge of Guidelines and Training in a UK District General Hospital (DGH). American Thoracic Society annual meeting. San Diego, May 2009 (poster).

Joshi V, McShane J, Soorae A, Page R, Carr R, Mediratta N, Shackcloth M, Poullis M. Clinical Upstaging Of Non-Small Cell Lung Cancer That Extends Across The Fissure: Implications For The Current TNM Classification System. European Association for Cardiothoracic Surgery. Lisbon, Sep 2008.

Publications

Book Chapters

Dimarakis I, Joshi V, Hesford W, Asimakopoulos G. Minimized Extracorporeal Circulation: Physiology and Pathophysiology. In: Minimized Cardiopulmonary Bypass: Techniques and Technologies. Gourlay T, Gunaydin S. Cambridge: Woodhead Publishing Ltd. Apr 2012

Published Manuscripts

Taylor M, Evison M, Clayton B, Grant SW, Martin GP, Shah R, Krysiak P, Rammohan K, Fontaine E, Joshi V, Granato F. Adequacy of Mediastinal Lymph Node Sampling in Patients With Lung Cancer Undergoing Lung Resection. *J Surg Res.* 2021 Oct 26;270:271-278.

Wilshire C.L, Blitz S.L, Fuller C.C, Rückert J.C, Li F, Cerfolio R.J, Ghanim A.F, Onaitis M.W, Sarkaria I.S, Wigle D.A, Joshi V, Reznik S, Bograd A.J, Vallières E, Louie B.E. Minimally invasive thymectomy for myasthenia gravis favours left-sided approach and low severity class. *Eur J Cardiothorac Surg* 2021 Oct 22;60(4):898-905.

Taylor M, Charlesworth M, Hayes T, Joshi V. Aetiology, management and strategies for prevention of postoperative respiratory failure (PORF) after thoracic surgery. *Shanghai Chest Journal* 2020, 1-11.

Joshi V, Dimarakis I. Objective analysis of postoperative air leaks can aid in decision-making, but does the use of digital drains really impact patient outcomes? *J Thorac Dis.* 2020 Aug; 12(8): 3927–3929.

Taylor M, Joshi V. The use of near infra-red fluorescence mapping with indocyanine green in thoracic surgery: an exciting real-world clinical application of an established scientific principle. VATS Vol4. Sep 2019

Joshi V, Cassivi SD, Milbrandt TA, Larson AN. Video-assisted thoracoscopic anterior vertebral body tethering for the correction of adolescent idiopathic scoliosis of the spine. Eur J Cardiothorac Surg. 2018 Dec 1;54(6):1134-1136.

Joshi V, Offer G, Richards C, Rathinam S. Chest Wall Resection and Reconstruction for Rosai-Dorfman Disease Masquerading as a Chest Wall Sarcoma. Ann R Coll Surg Engl 2018 Feb;100(2)

Vaja R, Sharkey A, Joshi V, Faulkner G, Harvey C. Should Neonates with Severe Congenital Diaphragmatic Hernia be Given the Option of ECMO? Eur J Cardiothorac Surg 2017 Sep 1;52(3):552-557

Vaja R, Joshi V, Dawson AG, Waller DA. Is Diagnostic VAT Thymectomy an Acceptable First-Line Approach To The Suspicious Mediastinal Mass? J Minimum Access Surg 2017 Oct-Dec;13(4):286-290

Vaja R, Joshi V, Faulkner G, Porter R, Harvey C. 5-Year Experience with Mobile Adult ECMO in a Tertiary Referral Centre. J Critical Care 2015 Dec; 30(6):1195-1198

Joshi V, Vaja R, Richens D. Cost Analysis on the Potential Benefit of Gentamicin Impregnated Collagen Sponges in Preventing Sternal Wound Infection Post Cardiac Surgery. J Wound Care 2016 Jan;25(1):22-5

Joshi V, Prosser K, Richens D. Early Prosthetic Valve Degeneration with Mitroflow Aortic Valves: Determination of Incidence and Risk Factors. Interact Cardiovasc Thorac Surg 2014 Jul;19(1):36-40

Prosser K, Joshi V, Skyoles J, Richens D. Severe Mitral Regurgitation Secondary to Atresia of the Posterior Mitral Valve Leaflet in the Adult: Is Repair Always Best Practice? Thorac Cardiovasc Surg Rep 2015 Dec;4(1):34-6

Joshi V. Out of Hours Intensive Care Unit Cover by Nurse Practitioners: Does This Have a Detrimental Effect Towards Critical Care Exposure to the Cardiothoracic Trainee? Eur J Cardiothorac Surg 2013 Nov ;44(5):967

Joshi V, Harvey C, Nakas A, Waller DA, Peek G, Firmin R. Thoracic Surgery in Adult Patients Receiving Extra Corporeal Membrane Oxygenation (ECMO): a 16 Year Experience. Perfusion 2013 Jul; 28(4):328-32.

Joshi V, Kirmani B, Zacharias J. Thoracotomy versus VATS: Is There an Optimal way to Treat Pneumothorax? Ann R Coll Surg Engl 2013 Jan;95(1):61-4.

Ashrafi M, Joshi V, Zammit M, Telford K. Intussusception of the Appendix Secondary to Mucinous Cystadenoma: A Rare Cause of Abdominal Pain. Int J Surg Case Reports 2011;2(2);26-27.

Joshi V, McShane J, Soorae A, Page R, Carr R, Mediratta N, Shackcloth M, Poullis M. Clinical Upstaging Of Non-Small Cell Lung Cancer That Extends Across The Fissure: Implications For Non-Small Cell Lung Cancer Staging. *Ann Thorac Surg* 2011;91:350-353.

Devbhandari M, Joshi V, Barber P, Krysiak P, Shah R, Jones MT. Active Treatment Rates For Lung Cancer In South Manchester: Are We Doing Enough? *Interact Cardiovasc Thorac Surg* 2010;11:411-14.

Joshi V, Koulaouzidis A, McGoldrick S, Tighe M, Tan C. Actinomycotic Liver Abscess: A Rare Complication of Colonic Diverticular Disease. *Ann Hepatology* 2010;1(9):96-98.

Joshi V, Harding GEJ, Bottoni DA, Lovell MB, Forbes TL. Determination of Functional Outcome Following Upper Extremity Arterial Trauma. *Vasc Endovascular Surg* 2007; 41(2):111-4.

Abstracts

Sharkey A, Vaja R, Fennell D, Joshi V, LeQuesne J, Muller S, Nakas A, Richards C, Waller DA. P180 Importance of Accurate Pre-operative Biopsy in the Radical Management of Mesothelioma – Don't Blame the Physician Just Keep Taking more Bites. *Thorax* 2014;69:A154-55.

Joshi V, Ismail N, Vaja R, Nakas A, Waller DA, Rathinam S. Audit of Trauma Practice in a Tertiary Referral Thoracic Surgical Centre in the United Kingdom: Implications of a Blanket Policy on the Admission of Blunt Thoracic Trauma Under Thoracic Surgeons. *Interact Cardiovasc Thorac Surg* 2014 Oct;19 (suppl_1).

Dawson AG, Baines C, Joshi V, O'Byrne KJ, Waller DA. Excision of the Primary in Stage IV Non-Small Cell Lung Cancer (NSCLC): A Feasibility Study. *Lung Cancer* 2014; Jan; 83(1):S78.

Joshi V, Tack G, de Ramon A. Collins A. Intercostal Chest Drain (ICD) Insertion: Knowledge of Guidelines and Training in a UK District General Hospital (DGH). *Am J Respir Crit Care Med* 197;2009:A5211.