



CHEST Curriculum Pathway for Pulmonary Hypertension

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Title: CHEST Curriculum Pathway for Pulmonary Hypertension

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Course Description

Start learning with the CHEST Curriculum Pathway for Pulmonary Hypertension. Follow the four paths from start to finish for a comprehensive overview of pulmonary hypertension diagnosis and management. Or, select the individual paths that best fit your daily work and clinical interests. Choose from topics like pulmonary arterial hypertension, chronic thromboembolic pulmonary hypertension, and right ventricular failure.

The pathway offers a variety of bite-sized educational resources you can review in 20 minutes or less. Explore case-based CHEST SEEK™ questions, videos and slide presentations from pulmonary hypertension experts, and research from the journal *CHEST*®.

Course Objectives

Pulmonary Arterial Hypertension:

After engaging with these educational activities, learners should be better able to:

1. Identify the clinical presentation of patients with pulmonary arterial hypertension (PAH) including history and examination.
2. Develop a diagnostic strategy for patients with pulmonary hypertension (PH) based upon guideline recommendations.
3. Utilize risk calculation strategies in the clinical decision-making process of patients with PH.
4. Apply guideline-based and risk-based criteria in making therapeutic choices in PAH.

Chronic Thromboembolic Pulmonary Hypertension:

After engaging with these educational activities, learners should be better able to:

1. Identify diagnostic modalities useful for establishing the diagnosis of chronic thromboembolic pulmonary hypertension (CTEPH).
2. Differentiate patients best served by surgery, balloon pulmonary angioplasty, and medical therapy for CTEPH.
3. Recognize common complications in the postoperative period following pulmonary thromboendarterectomy.

Pulmonary Hypertension Related to Heart and Lung Disease:

After engaging with these educational activities, learners should be better able to:

1. Describe the prognostic importance of pulmonary hypertension (PH) in patients with interstitial lung disease (ILD) and left-sided heart disease.
2. Explain the impact of PH therapy in patients with PH due to ILD or left-sided heart disease.

Right Ventricular Failure:

After engaging with these educational activities, learners should be better able to:

1. Explain the pathophysiology of decompensated right ventricular failure.
2. Illustrate the fundamentals of management of the pulmonary hypertension patient in the perioperative period.
3. Distinguish key therapeutic interventions in decompensated right ventricular failure.

Participation Feedback

The participation threshold or passing standard for this course includes learner completion of the final self-assessment and learner completion of the CME evaluation including the identification of what changes the learner expects to make in practice due to participation of this course.

Maintenance of Licensure

Maintenance of Credit (MOC) offered in medical knowledge Scope of Practice-Pulmonary Education.

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DISCLOSURE OF FINANCIAL RELATIONSHIPS

The mission and vision of CHEST include our commitment to providing accurate, balanced, evidence-based information to health care professionals participating in this educational course. To guarantee our accredited continuing education is fair and balanced and that any clinical content presented supports safe, effective patient care, we require all planners, faculty, and others in control of educational content to complete and submit financial disclosures of any relevant financial relationships with [Accreditation Council for Continuing Medical Education defined ineligible companies](#) within the prior 24 months. We value the contributions of those who are committed and passionate about pulmonary medicine and want to be a part of our educational courses; however, it is our commitment to our learners to have continuing education free of commercial bias and marketing.

Identified conflicts of interest are reviewed by the educational course course director/chair, the Education Committee, and/or the Professional Standards Committee to ensure conflicts are properly mitigated. CHEST educational standards pertaining to conflict of interest are intended to ensure the delivery of balanced, evidence-based, scientific presentations. Disclosure of any or no relevant financial relationships will be made available online in course materials and on site during all educational courses.

The following faculty/planner members of this course have disclosed to CHEST that they have a financial relationship with a commercial interest as it relates to the course:

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Sebastian Ley, MD	Planner	Consultant relationship: Bayer AG, Boehringer Ingelheim International GmbH, CSL, and AstraZeneca
Neil R. MacIntyre, MD, FCCP	Planner	Consultant fee: breathe technology, Hillrom, Alana Healthcare, Inspirix Technologies LLC, and Ventec Life Systems
Atul Malhotra, MD	Planner	Medical education funding relationship: LivaNova PLC, Equillium Bio, and CorVus Biomedical, LLC
Darcy D. Marciniuk, MD, Master FCCP	Planner	Scientific medical advisor relationship: Health Canada, Lung Association of Saskatchewan, Saskatchewan Ministry of Health, Saskatchewan Health Authority Research relationship: AstraZeneca (funds held and managed by University of Saskatchewan), Boehringer Ingelheim International GmbH (funds held and managed by University of Saskatchewan), Canadian Institutes of Health Research, GSK plc (funds held and managed by University of Saskatchewan), Grifols, S. A. (funds held and managed by University of Saskatchewan), Lung Association of Saskatchewan, Novartis AG (funds held and managed by University of Saskatchewan), Sanofi (funds held and managed by University of Saskatchewan), Schering-Plough Corporation (funds held and managed by University of Saskatchewan), Syneos Health, Pearl Therapeutics (AstraZeneca), McGill University Health Centre, Parexel International (MA) Corporation, and the Saskatchewan Health Research Foundation
Stephen C. Mathai, MD, MHS, FCCP	Planner	GSK plc, Bristol-Myers Squigg Company (Celgene), UpToDate, and Bayer AG Consultant relationship: Johnson & Johnson Services, Inc. (Actelion)/Janssen Global Services, Inc., Liquidia Corporation, Theravance Biopharma, and United Therapeutics Corporation Research support (to institution): Johnson & Johnson Services, Inc. (Actelion), United Therapeutics Corporation, National Scleroderma Foundation, National Institutes of Health/National Heart, Lung, and Blood Institute, and the US Department of Defense Rare disease advisory panel member relationship: Patient-Centered Outcomes Research Institute
Jeremy A. Mazurek, MD	Planner	Advisory board relationship: United Therapeutics Corporation
Peter J. Mazzone, MD, MPH, FCCP	Planner	Research support: Veracyte, Inc., Delfi Medical Innovations Inc., Nucleix, Biodesix, PrognomiQ, ADELA, Inc., MagArray, Inc., and Exact Sciences Corporation

Robyn L. McClelland, PhD	Planner	Observational study monitoring board: RURAL Cohort Study
Vallerie McLaughlin, MD	Planner	Research support/grants: Aerovate Therapeutics; Altavant Sciences, Inc.; Gossamer Bio; Janssen Global Services, Inc; Keros Therapeutics; Merck & Co., Inc.,; and SoniVie Consultant relationship: Aerami Therapeutics Holdings, Inc.; Aerovate Therapeutics; Altavant Sciences, Inc.; Apollo Pharmac; Bayer AG; CVS Caremark; CorVista Health; Gossamer Bio; Janssen Global Services, Inc.; Keros Therapeutics; Liquidia Corporation; Morphic Therapeutic; Regeneron Pharmaceuticals Inc; Respira Therapeutics Inc; Roivant Sciences; and United Therapeutics Corporation
Lana Melendres-Groves, MD	Planner	Bayer AG, United Therapeutics Corporation, and Janssen Global Services, Inc.
Christopher Mullin, MD, MHS	Planner	Consultant relationship: Regeneron Pharmaceuticals Inc. Data and safety monitoring board member relationship: SEPVADIS Study (NCT04797286)
Septimiu D. Murgu, MD, FCCP	Planner	Educational consultant relationship: Olympus Corporation, Boston Scientific Corporation, and Johnson & Johnson Services, Inc.
Mangala Narasimhan, DO, FCCP	Planner	Advisory board relationship: Pfizer Inc.
Steven D. Nathan, MD	Planner	Writing support: United Therapeutics Corporation Consultant relationship: United Therapeutics Corporation, Bellerophon Therapeutics, Merck & Co., Inc., Bayer AG, F. Hoffman-La Roche Ltd, Third Pole, Inc., and Boehringer Ingelheim International GmbH Expert testimony relationship: F. Hoffman-La Roche Ltd Speaker's bureau relationship: United Therapeutics Corporation, Bayer AG, and Boehringer Ingelheim International GmbH
Horst Olschewski, MD	Planner	Grant support: Bayer AG, Johnson & Johnson Services, Inc. (Actelion), F. Hoffman-La Roche Ltd, Boehringer Ingelheim International GmbH, and Algorithm Sciences Personal fees and nonfinancial support: Bayer AG, Johnson & Johnsons Services, Inc. (Actelion), Pfizer, Inc., Novartis AG, AstraZeneca, Boehringer Ingelheim International GmbH, CHIESI USA, Inc., Menarini Group, Merck & Co., Inc., GSK plc, Inventiva, and Janssen Global Services, Inc.
Ronald J. Oudiz, MD	Planner	Research support: Aadi Bioscience, Accelleron/Merck & Co., Inc., Gossamer Bio, Insmmed Incorporated, Johnson & Johnson Services, Inc., Liquidia Corporation, and United Therapeutics

		<p>Corporation</p> <p>Consultant and speaker's bureau relationship: Accelleron/Merck & Co., Inc., Insmmed Incorporated, Johnson & Johnson Services, Inc., Liquidia Corporation, Medtronic, Respira Therapeutics Inc., United Therapeutics Corporation, and V-Wave Ltd</p>
Harold I. Palevsky, MD	Planner	<p>Honoraria relationship: Johnson & Johnson Services, Inc. (Actelion)/Janssen Global Services Inc., Accelleron, PhaseBio Pharmaceuticals, Inc., and United Therapeutics Corporation</p>
David Poch, MD	Planner	<p>Principal investigator relationship: United Therapeutics Corporation, PhaseBio Pharmaceuticals, Inc., Accelleron, and Janssen Global Services, Inc.</p>
Ioana R. Preston, MD	Planner	<p>Medical writing support: Parexel International (MA) Corporation</p> <p>Grant support: Accelleron, Johnson & Johnson Services, Inc. (Actelion), PhaseBio Pharmaceuticals, Inc., Tenax Corporation, and United Therapeutics Corporation</p> <p>Honoraria: MedOnTheGo, Medscape, and Integrity Continuing Education Inc.</p> <p>Expert testimony relationship: Bayer AG</p> <p>Data and safety monitoring board relationship: Accelleron, Johnson & Johnson Services, Inc. (Actelion), Altavant Sciences, Inc., Respira Therapeutics Inc., Pfizer, Inc., and United Therapeutics Corporation</p> <p>Leadership role relationship: International Society for Heart and Lung Transplantation</p>
J. Javier Provencio, MD	Planner	<p>Consultant and advisory committee member relationship: Minnetronix Medical. and Cryothermic Systems Incorporated</p>
Franck F. Rahaghi, MD, MHS, FCCP	Planner	<p>Writing support: United Therapeutics Corporation</p> <p>Grant funding: Bayer AG, Janssen Global Services, Inc., and Accelleron</p> <p>Honoraria: United Therapeutics Corporation, Janssen Global Services, Inc., and Bayer AG</p> <p>Consultant, teaching, and speaker relationship: Boehringer Ingelheim International GmbH, Janssen Global Services, Inc., Bayer AG, United Therapeutics Corporation, Grifols, S. A., and Takeda Pharmaceutical Company Limited</p> <p>Consultant relationship: Novartis AG</p>
Sudarshan Rajagopal, MD	Planner	<p>Consultant relationship: APIE Therapeutics, Altavant Sciences, Inc., Gossamer Bio, Insmmed Incorporated, Janssen Global Services, Inc., Liquidia Corporation, Polarean, Inc., and United Therapeutics Corporation</p> <p>Funding support: Janssen Global Services, Inc. and United Therapeutics Corporation</p> <p>Patent holder on US patent 62/673/3,175 entitled</p>

		"Dynamic 129Xe Gas Exchanged Spectroscopy" that is licensed to Polarean, Inc.
Todd W. Rice, MD, MSc, FCCP	Planner	Consultant relationship: Cumberland Pharmaceuticals, Sanofi, and Cytovale, Inc. Board of directors relationship: American Society for Parenteral and Enteral Nutrition Investigator of study relationship: AbbVie Inc.
Franz Rischard, MD	Planner	Consultant relationship: Accelleron and United Therapeutics Corporation Steering committee relationship: Accelleron, Insmed Incorporated, United Therapeutics Corporation, Bayer AG, Janssen Global Services, Inc., and AADI Bioscience
Belinda N. Rivera-Lebron, MD, FCCP	Planner	Site principal investigator and global study investigator: Johnson & Johnson Services, Inc. Medical education consultant relationship: Inari Medical Intellectual property relationship: McGraw Hill and Wolters Kluwer N. V. Consultant relationship: Bayer AG, Johnson & Johnson Services, Inc., and Bristol-Myers Squibb Company Research support: Johnson & Johnson Services, Inc. and Boston Scientific Corporation Board of directors relationship: The PERT Consortium
Stephan Rosenkranz, MD, PhD	Planner	Grant funding: Johnson & Johnson Services, Inc. (Actelion), AstraZeneca, Bayer AG, Janssen Global Services, Inc., and Novartis AG Consultant relationship: Abbott, Accelleron, Johnson & Johnson Services, Inc. (Actelion), Bayer AG, Janssen Global Services, Inc., Merck & Co., Inc., Novartis AG, Pfizer, Inc., United Therapeutics Corporation, and CSL Honoraria: Johnson & Johnson Services, Inc. (Actelion), Bayer AG, Bristol-Myers Squibb Company, Ferrer, GSK plc, Janssen Global Services, Inc., Merck & Co., Inc., Novartis AG, Pfizer, Inc., United Therapeutics Corporation, and CSL
John J. Ryan, MD	Planner	Monetary and nonmonetary support for advisory board relationship: Bayer AG
Zeenat Safdar, MD	Planner	Medical writing support: United Therapeutics Corporation Consultant and advisory board relationship: United Therapeutics Corporation, Johnson & Johnson Services, Inc., Bayer AG, Genentech, Inc., Boehringer Ingelheim International GmbH, and United Therapeutics Corporation
Sandeep Sahay, MD, FCCP	Planner	Consultant relationship: Johnson & Johnson Services, Inc. (Actelion), Bayer AG, Gossamer Bio, Liquidia Corporation, United Therapeutics

		<p>Corporation, Janssen Services, Inc., and Accelleron</p> <p>Scientific medical advisor relationship: Bayer AG</p> <p>Speaker/speaker's bureau relationship: United Therapeutics Corporation, Janssen Global Services, Inc. (honorarium received by Houston Methodist) and Bayer AG</p> <p>Honoraria: Johnson & Johnson Services, Inc., United Therapeutics Corporation, Liquidia Corporation, Gossamer Bio, GSK plc, and Bayer AG</p> <p>Has received a patent submitted for Johnson & Johnson Services, Inc. as an inventor (secondary titration of UPTRAVI)</p> <p>Data and safety monitoring board for a clinical trial sponsored by the National Institutes of Health</p> <p>Advisory board relationship: United Therapeutics Corporation, Bayer AG, Liquidia Corporation, and Accelleron</p> <p>Research grant: United Therapeutics Corporation</p> <p>Clinical trial support: United Therapeutics Corporation, Janssen Global Services, Inc., Gossamer Bio, Altavant Sciences, Inc., Liquidia Corporation, Boehringer Ingelheim International GmbH, and Novartis AG</p>
Christian E. Sandrock, MD, MPH, FCCP	Planner	<p>Honoraria and speaker's bureau relationship: AbbVie Inc. (Allergan), Pfizer, Inc., Merck & Co., Inc., Actavis, Inc., and Cubist IT AB</p> <p>Consultant relationship with fee: Theravance Biopharma</p> <p>Grant research support: Nabriva Therapeutics plc</p>
Gregory A. Schmidt, MD, FCCP	Planner	<p>Editor/author relationship: McGraw Hill and Springer Nature</p> <p>Author relationship: UpToDate</p>
Mary Beth Scholand, MD, FCCP	Planner	<p>Advisory committee member relationship: Veracyte, Inc., Genentech, Inc., and United Therapeutics Corporation</p> <p>Speaker/speaker's bureau relationship: Boehringer Ingelheim International GmbH</p>
Mona Selej, MD	Faculty	<p>Employee and stockholder relationship: Johnson & Johnson Services, Inc. (Actelion)</p>
Trushil Shah, MD	Planner	<p>Consultant relationship: Bayer AG and Liquidia Corporation</p> <p>Research support to institution for clinical trial work from Janssen Global Services, Inc., Bayer AG, Liquidia Corporation, Regeneron Pharmaceuticals Inc., and United Therapeutics Corporation</p>
Eric Shen, PharmD	Faculty	<p>Employee of United Therapeutics Corporation</p>
Oksana A. Shlobin, MD, FCCP	Planner	<p>Honoraria: United Therapeutics Corporation, Bayer AG, and Johnson & Johnson Services, Inc.</p> <p>Data and safety monitoring and advisory board relationship: United Therapeutics Corporation,</p>

		Bayer, AG Johnson & Johnson Services, Inc., and Altavant Sciences, Inc.
Gerard A. Silvestri, MD, Master FCCP	Planner	Educational consultant relationship: Biodesix, AstraZeneca, Olympus Corporation Educational industry-sponsored activity relationship: Biodesix
Peter Smith, PharmD	Faculty	Employee of United Therapeutics Corporation
Namita Sood, MD, FCCP	Planner	Speaker's bureau relationship: Boehringer Ingelheim International GmbH and Bayer AG Consultant and advisory board relationship: Merck & Co., Inc., Liquidia Corporation, and United Therapeutics Corporation Research relationship: United Therapeutics Corporation, Janssen Global Services, Inc., Altavant Sciences, Inc., Gossamer Bio, F. Hoffman-La Roche Ltd, Fibrinogen, Merck & Co., Inc., Bayer AG, Bellerophon Therapeutics, and Respira Therapeutics Inc.
Virginia D. Steen, MD	Planner	Institution received grants with a portion going to salary support for Dr. Steen from Bayer AG, CSL, and University of Michigan/Bristol-Myers Squibb Company Institution received grants with no salary support going to Dr. Steen from Cytari Therapeutics Inc., Gilead Services, and Reata Pharmaceuticals Advisory board relationship: Johnson & Johnson Services, Inc. (Actelion), Bayer AG, Bristol-Myers Squibb Company, Cytari Therapeutics Inc., Gilead Services, and Reata Pharmaceuticals
Mary E. Strek, MD, FCCP	Planner	Principal investigator and medical writing assistance relationship: Boehringer Ingelheim International GmbH and Galapagos NV Endpoint adjudication committee member relationship: Fibrinogen
Roxana Sulica, MD	Planner	Contacted research (to institution): Bayer AG, United Therapeutics Corporation, Altavant Sciences, Inc., Gossamer Bio, Merck & Co., Inc., Accelleron, and Bellerophon Therapeutics Advisory board relationship: Bayer AG, United Therapeutics Corporation, Altavant Sciences, Inc. Gossamer Bio, Merck & Co., Inc., and Accelleron
Victor F. Tapson, MD	Faculty	Employee of Inari Medical Research support: Bayer AG, Boston Scientific Corporation, Daiichi Sankyo Company, Genentech, Inc., and Janssen Global Services, Inc. Steering committee relationship: Bayer AG, BiO2 Medical, Penumbra, Daiichi, Thrombolex, and United Therapeutics Consultant relationship: Janssen and Bio2 Medical Inc Speaker relationship/honoraria: Janssen Global

		Services, Inc.
Fernando Torres, MD	Planner	Consultant relationship: Altavant Sciences, Inc., Bayer AG, and United Therapeutics Corporation Data and safety monitoring board relationship: Pfizer, Inc. Fees to institution for research with United Therapeutics Corporation
Momen M. Wahidi, MD, MBA, FCCP	Planner	Consultant relationship: Olympus Corporation, Pulmonx Corporation, Cook, Veracyte, Inc., and Verathon Inc.
Aaron B. Waxman, MD, PhD	Planner	Investigator and steering committee chair relationship: United Therapeutics Corporation and Accelleron Principal investigator relationship: ARIA CV Inc. Grant support: Janssen Global Services, Inc.; R01HL158077 Co-I; R01HL160025 Co-I Co-principal investigator relationship: PVDomics
Carol Zhao, MS	Faculty	Employee of Actelion Current stockholder of Johnson & Johnson Services, Inc.

The remaining faculty/planner members of this course that are not listed in the grid above have indicated to CHEST that they have no relevant financial relationships with any commercial interests.

CHEST CME Staff Planners

The following CME Staff Planners have no financial relationships to disclose:

Manuel Alfaro, MBA
 Nicki Augustyn, CAE
 Conrad Allen
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 Carolyn M. Jones
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