SCE 0805 Public Evidence Appendix

Pulmonary disease

Literature review date: September 13, 2026

Controlling principle. Pulmonary evidence is syndrome-, product-, route-, age-, and endpoint-specific. Mechanistic or early-phase signals must not be converted into claims of restored lung architecture or proven clinical benefit.

Evidence map

Domain	Evidence posture	Interpretive boundary
Acute respiratory distress syndrome	Research explores immunomodulation, barrier support, alveolar-fluid clearance, antimicrobial signaling, and secondary injury.	Does not replace lung-protective ventilation, treatment of the cause, fluid strategy, prone positioning, or evidence-based critical care.
Chronic obstructive pulmonary disease	Studies explore inflammatory, endothelial, immunomodulatory, and tissue-supportive effects.	Biomarker or symptom changes do not establish regeneration of emphysematous lung or durable reduction in exacerbations.
Pulmonary fibrosis	Research examines fibroblast/myofibroblast activity, inflammatory pathways, epithelial injury, and matrix remodeling.	Preclinical antifibrotic signals do not establish reversal of established human fibrosis.
Bronchopulmonary dysplasia	Perinatal research explores alveolarization, vascular development, immunomodulation, and reduction of secondary injury.	Developmental stage, gestational age, respiratory support, product, dose, timing, and long-term development materially affect interpretation.
Pulmonary hypertension	Predominantly preclinical work investigates endothelial repair, angiogenic balance, inflammation, and vascular remodeling.	Vascular biological effects do not establish reduced pulmonary vascular resistance, delayed clinical worsening, or survival.
Postinfectious lung injury	Research explores persistent inflammation, epithelial/endothelial injury, organizing responses, fibrosis, and repair.	Postinfectious syndromes are heterogeneous; imaging or physiologic improvement does not alone establish durable clinical benefit.

Key evidence conclusions

Pulmonary indications are not interchangeable. Acute inflammatory lung injury, chronic obstructive disease, fibrosis, neonatal developmental lung disease, pulmonary vascular disease, and postinfectious injury require separate interpretation.

Mechanism is not architectural restoration. Anti-inflammatory, vascular, epithelial, or antifibrotic signaling does not by itself establish regeneration of damaged lung.

Age and disease stage matter. Neonatal BPD and adult pulmonary disease differ fundamentally in developmental biology, risk, endpoints, and follow-up requirements.

Established pulmonary care remains the comparator. Evidence-based critical care, inhaled therapies, antifibrotic treatment where indicated, rehabilitation, oxygen, and disease-specific pulmonary-hypertension therapy remain distinct from investigational MSC/EV approaches.

Principal references

1. Galipeau J, Sensebé L. Mesenchymal stromal cells: clinical challenges and therapeutic opportunities. Cell Stem Cell. 2018;22:824-833.

2. Pittenger MF, Discher DE, Péault BM, Phinney DG, Hare JM, Caplan AI. Mesenchymal stem cell perspective: cell biology to clinical progress. NPJ Regen Med. 2019;4:22.

3. Relevant contemporary clinical and translational literature concerning MSC/EV interventions in ARDS, COPD, pulmonary fibrosis, bronchopulmonary dysplasia, pulmonary hypertension, and postinfectious lung injury.

4. Disease-specific pulmonary, critical-care, neonatal, and pulmonary-hypertension guidelines should control statements concerning established standard care.

5. Product identity, disease phenotype, age group, route, dose, comparator, respiratory support, endpoint, and follow-up must be matched before evidence is generalized.