Appendix D. Quality and Applicability of Included Studies

**Table D-1. Quality and applicability for KQ 1 studies**

| **Study** | **Test Measures** | **Quality** | **Limitations to Applicability** |
| --- | --- | --- | --- |
| Ajami, 20111 | * TRV/VTIRVOT | Good | * Participants had widely differing degrees of disease severity * Included patients did not match the review question * Study excluded participants with other conditions that might be easily confused with PAH such as PH due to heart failure, thrombotic disease, COPD |
| Allanore, 20082 | * NT-proBNP, plasma * sPAP | Good | * Included patients did not match the review question * Study excluded participants with other conditions that might be easily confused with PAH such as PH due to heart failure, thrombotic disease, COPD * Index test, its conduct, or interpretation differed from the review question |
| Arcasoy 20033 | * sPAP * RAP | Good | * Study population is inadequately described * Included patients did not match the review question * Study included patients with a wide variety of conditions in addition to the target population |
| Bogdan, 19984 | * cGMP, urine | Poor | * Participants were at widely differing points in natural history of disease * Participants had widely differing degrees of disease severity * Included patients did not match the review question * Study excluded participants with other conditions that might be easily confused with PAH such as PH due to heart failure, thrombotic disease, COPD * Study included patients with a wide variety of conditions in addition to the target population |
| Bonderman, 20115 | * NT-proBNP * sPAP * RA size * RV size * TAPSE | Good | * Included patients did not match the review question |
| Cavagna, 20106 | * BNP * NT-proBNP | Good | * Study excluded participants with other conditions that might be easily confused with PAH such as PH due to heart failure, thrombotic disease, COPD * None |
| Cevik, 20127 | * RIMP/MPI/Tei index * mPAP * S’ * TAPSE * TRV/VTIRVOT | Fair | * Study population is inadequately described * Study excluded participants with other conditions that might be easily confused with PAH such as PH due to heart failure, thrombotic disease, COPD * Care delivery setting is widely divergent from typical U.S. setting |
| Ciurzynski, 20118 | * Transtricuspid gradient rest/exercise | Good | * None |
| Colle, 20039 | * sPAP | Good | * None |
| Condliffe, 201110 | * Tricuspid gradient | Fair | * None |
| Dahiya, 201011 | * TRV/VTIRVOT | Good | * Participants were at widely differing points in natural history of disease * Participants had widely differing degrees of disease severity |
| Denton, 199712 | * RV size * sPAP | Fair | * None |
| Farber, 201113 | * sPAP * RAP | Fair | * None |
| Fisher, 200914 | * sPAP * Transtricuspid gradient | Good | * Study excluded participants with other conditions that might be easily confused with PAH such as PH due to heart failure, thrombotic disease, COPD |
| Fitzgerald, 201215 | * TRV * mPAP | Poor | * Study population is inadequately described * Participants were at widely differing points in natural history of disease * Participants had widely differing degrees of disease severity * Included patients did not match the review question * Index test, its conduct, or interpretation differed from the review question * Cointerventions/treatments did not adequately reflect routine clinical practice |
| Fonseca, 201116 | * TRV * Uric acid | Fair | * None |
| Frea, 201117 | * NT-proBNP * FAC * RIMP/MPI/Tei index * RV size * TRV/VTIRVOT * TAPSE | Fair | * Index test, its conduct, or interpretation differed from the review question |
| Fukuda, 201118 | * FAC * TAPSE * RIMP/MPI/Tei index * sPAP | Fair | * Participants had widely differing degrees of disease severity * Included patients did not match the review question * Study excluded participants with other conditions that might be easily confused with PAH such as PH due to heart failure, thrombotic disease, COPD |
| Ghio, 200419 | * NT-proBNP | Fair | * Target condition as defined by the reference standard did not match the review question |
| Gialafos, 200820 | * NT-proBNP * RIMP/MPI/Tei index | Fair | * None |
| Hachulla, 200521 | * TRV | Poor | * None |
| Hammerstingl, 201222 | * sPAP * mPAP | Fair | * Participants were at widely differing points in natural history of disease * Participants had widely differing degrees of disease severity * Included patients did not match the review question * Study included patients with a wide variety of conditions in addition to the target population * Index test, its conduct, or interpretation differed from the review question * Equipment or operator level of training/proficiency is not widely available * Intervention (active arm) was not similar to that used in routine clinical practice |
| Hsu, 200823 | * sPAP | Good | * None |
| Hua, 200924 | * sPAP | Good | * None |
| Jansa, 201225 | * TRV | Fair | * Participants were at widely differing points in natural history of disease * Participants had widely differing degrees of disease severity |
| Kovacs, 201026 | * sPAP rest and exercise | Good | * None |
| Lindqvist, 201127 | * TRV/VTIRVOT | Fair | * Participants had widely differing degrees of disease severity * Included patients did not match the review question |
| Low, 201128 | * Transtricuspid gradient | Poor | * Participants were at widely differing points in natural history of disease * Participants had widely differing degrees of disease severity * Included patients did not match the review question |
| Machado, 200629 | * NT-proBNP | Poor | * None |
| McLean, 200730 | * RV end-diastolic diameter (RVD) * Tpeak (RV tricuspid annular motion by TDI, time from beginning of IC to first Sm peak) | Poor | * Participants were at widely differing points in natural history of disease * Participants had widely differing degrees of disease severity * Included patients did not match the review question * Study included patients with a wide variety of conditions in addition to the target population * Index test, its conduct, or interpretation differed from the review question * Intervention (active arm) was not similar to that used in routine clinical practice * Cointerventions/treatments did not adequately reflect routine clinical practice |
| Mourani, 200831 | * RA size * RV size * Transtricuspid gradient | Fair | * Participants were at widely differing points in natural history of disease * Participants had widely differing degrees of disease severity * Included patients did not match the review question * Study excluded participants with other conditions that might be easily confused with PAH such as PH due to heart failure, thrombotic disease, COPD * Study included patients with a wide variety of conditions in addition to the target population |
| Mukerjee, 200432 | * sPAP | Fair | * Index test, its conduct, or interpretation differed from the review question * Potential adverse events associated with testing or treatment were not measured or reported |
| Murata, 199733 | * sPAP | Fair | * Included patients did not match the review question * Study excluded participants with other conditions that might be easily confused with PAH such as PH due to heart failure, thrombotic disease, COPD |
| Nakayama, 199834 | * sPAP * mPAP | Fair | * Included patients did not match the review question * Study excluded participants with other conditions that might be easily confused with PAH such as PH due to heart failure, thrombotic disease, COPD * Potential adverse events associated with testing or treatment were not measured or reported |
| Nogami, 200935 | * sPAP | Good | * Participants had widely differing degrees of disease severity * Included patients did not match the review question * Study included patients with a wide variety of conditions in addition to the target population |
| Phung, 200936 | * sPAP | Good | * Study included patients with a wide variety of conditions in addition to the target population |
| Pilatis, 200037 | * RV size * sPAP | Fair | * Target condition as defined by the reference standard did not match the review question * Potential adverse events associated with testing or treatment were not measured or reported |
| Rajagopalan, 200938  Rajagopalan, 200739 | * TRV/VTIRVOT * sPAP * S’ | Fair | * Participants were at widely differing points in natural history of disease * Participants had widely differing degrees of disease severity * Included patients did not match the review question * Study excluded participants with other conditions that might be easily confused with PAH such as PH due to heart failure, thrombotic disease, COPD * Study included patients with a wide variety of conditions in addition to the target population |
| Rajaram, 201240 | * sPAP * mPAP * Pericardial effusion | Fair | * None |
| Rich, 201141 | * sPAP | Good | * Included patients did not match the review question * Study excluded participants with other conditions that might be easily confused with PAH such as PH due to heart failure, thrombotic disease, COPD * Index test, its conduct, or interpretation differed from the review question |
| Roeleveld, 200542 | * sPAP | Fair | * Included patients did not match the review question * Study excluded participants with other conditions that might be easily confused with PAH such as PH due to heart failure, thrombotic disease, COPD |
| Roule, 201043 | * TRV * TRV/VTIRVOT | Good | * Study excluded participants with other conditions that might be easily confused with PAH such as PH due to heart failure, thrombotic disease, COPD |
| Ruan, 200744 | * FAC * RV size * sPAP | Fair | * Participants were at widely differing points in natural history of disease * Participants had widely differing degrees of disease severity * Included patients did not match the review question * Study excluded participants with other conditions that might be easily confused with PAH such as PH due to heart failure, thrombotic disease, COPD |
| Ruiz-Irastorza, 201245 | * sPAP * mPAP | Fair | * Participants were at widely differing points in natural history of disease * Participants had widely differing degrees of disease severity * Study included patients with a wide variety of conditions in addition to the target population |
| Sanli, 201246 | * RV size * mPAP * Nitric oxide * RIMP/MPI/Tei index * TAPSE | Fair | * Study population is inadequately described * Participants were at widely differing points in natural history of disease * Participants had widely differing degrees of disease severity * Study included patients with a wide variety of conditions in addition to the target population |
| Selby, 201247 | * sPAP | Fair | * Study population is inadequately described |
| Selimovic, 200748 | * sPAP * mPAP | Good | * Included patients did not match the review question * Study excluded participants with other conditions that might be easily confused with PAH such as PH due to heart failure, thrombotic disease, COPD |
| Simeoni, 200849 | * NT-proBNP | Poor | * Participants were at widely differing points in natural history of disease * Participants had widely differing degrees of disease severity * Included patients did not match the review question * Study excluded participants with other conditions that might be easily confused with PAH such as PH due to heart failure, thrombotic disease, COPD * Study included patients with a wide variety of conditions in addition to the target population |
| Steen, 200850 | * sPAP rest/exercise | Fair | * Target condition as defined by the reference standard did not match the review question * Surrogate outcomes were not sufficiently clinically relevant |
| Takatsuki, 201251 | * S’ * mPAP | Fair | * Study population is inadequately described * Participants were at widely differing points in natural history of disease * Participants had widely differing degrees of disease severity * Study excluded participants with other conditions that might be easily confused with PAH such as PH due to heart failure, thrombotic disease, COPD |
| Tei, 199652 | * RIMP/MPI/Tei index | Poor | * Participants were at widely differing points in natural history of disease * Participants had widely differing degrees of disease severity * Included patients did not match the review question * Study excluded participants with other conditions that might be easily confused with PAH such as PH due to heart failure, thrombotic disease, COPD |
| Tian, 201153 | * sPAP * mPAP | Fair | * Included patients did not match the review question * Study excluded participants with other conditions that might be easily confused with PAH such as PH due to heart failure, thrombotic disease, COPD |
| Thakkar, 201254 | * sPAP * NT-proBNP | Fair | * Participants were at widely differing points in natural history of disease * Participants had widely differing degrees of disease severity * Included patients did not match the review question * Study excluded participants with other conditions that might be easily confused with PAH such as PH due to heart failure, thrombotic disease, COPD * Study included patients with a wide variety of conditions in addition to the target population |
| Torregrosa, 200155 | * sPAP | Fair | * None |
| Toyono, 200856 | * BNP | Good | * Participants were at widely differing points in natural history of disease * Participants had widely differing degrees of disease severity |
| Tutar, 199957 | * Endothelin-1, plasma | Fair | * Participants had widely differing degrees of disease severity |
| Vlahos, 200758 | * TRV/VTIRVOT | Poor | * Included patients did not match the review question * Study excluded participants with other conditions that might be easily confused with PAH such as PH due to heart failure, thrombotic disease, COPD |
| Vonk, 200759 | * RIMP/MPI/Tei index * sPAP | Fair | * None |
| Willens, 200860 | * sPAP | Fair | * Included patients did not match the review question |
| Williams, 200661 | * NT-proBNP | Fair | * None |

Abbreviations: BNP=brain natriuretic peptide; cGMP= cyclic guanosine monophosphate; CHF=congestive heart failure; COPD=chronic obstructive pulmonary disease; CTEPH=chronic thromboembolic pulmonary hypertension; CVD=collagen vascular disease; DLCO=diffusion capacity of the lung for carbon monoxide; FAC=fractional area change; mPAP=mean pulmonary artery pressure; MPI=myocardial performance index; NT-proBNP=N-terminal pro-B-type natriuretic peptide; NYHA=New York Heart Association; PAH=pulmonary arterial hypertension; PH=pulmonary hypertension; PPH=primary pulmonary hypertension; PVR=pulmonary vascular resistance; RA=right atrium; RHC=right heart catheterization; RIMP=right index of myocardial performance; RV=right ventricle; S’=tricuspid lateral annular systolic velocity; sPAP=systolic pulmonary artery pressure; SSc=systemic sclerosis; TAPSE=tricuspid annular plane systolic excursion; TDI=tissue Doppler imaging; TRV=tricuspid regurgitant jet velocity; VSD=ventricular septal defect; VTIRVOT=velocity-time integral of right ventricular outflow tract