

Table 1. Study characteristics

Study	Type of study	Region/ country	Surgery	Number of patients	Age	M/F	PPC definition	PPC incidence ¹ N (%)	ARISCAT score
Canet (2010)	Development and internal validation of the ARISCAT model	Spain	Surgical procedures given general, neuraxial, or regional anesthesia	2,464	Median 60 years	Male n (%) 1,251 (50.8%)	A composite of: respiratory infection, respiratory failure, pleural effusion, atelectasis, pneumothorax, bronchospasm, aspiration pneumonia	123 (5.0%)	Median (IQR) 11 (3 to 24), range 0–101
Mazo (2014)	External validation ARISCAT in three separate European cohorts (PERISCOPE)	Spain, Western Europe (WE), Eastern Europe (EE)	Non-obstetric elective or emergency surgery	Total: 5,009	Median 59.1 years	Male n (%) 2,606 (51.1%)	Any one or more of: respiratory failure, suspected pulmonary infection, pleural effusion, atelectasis, pneumothorax, bronchospasm, aspiration pneumonia	404 (7.9%)	Median (IQR) 15 (3 to 26), range 0 to 95
				Spain: 2,000	Median 62.1 years	Male n (%) 1,054 (52.7%)		114 (5.7%)	Median (IQR) 16 (3 to 28), range 0 to 81
				WE: 1,538	Median 58.4 years	Male n (%) 778 (50.6%)		126 (8.2%)	Median (IQR), 11 (3 to 26), range 0 to 95
				EE: 1,561	Median 54.7 years	Male N (%) 774 (49.6%)		164 (10.5%)	Median (IQR) 14 (3 to 26), range 0 to 76
Jin (2015)	Development and internal validation of new model and comparison with ARISCAT ²	China	Non-cardiac surgery	1,673 (771 in validation cohort)	Median 49 years	Male n (%) 334 (43.3%)	Respiratory infection, respiratory failure, pleural effusion, atelectasis, pneumothorax, bronchospasm, aspiration pneumonia	163 (9.7%)	NR
Neto (2018)	Development and internal validation of new model and comparison with ARISCAT ²	146 hospitals in 29 countries	Adult patients requiring intra-operative ventilation during general anesthesia for surgery.	6,063 (2,144 in validation cohort)	Median 55 years	Male 931 / 2,144 (43.4%)	A composite of unplanned supplementary oxygen, respiratory failure, unplanned new or prolonged invasive mechanical ventilation, ARDS, pneumonia and/or pneumothorax	246 / 2,144 (11.5%)	Median (IQR) 15 (3 to 26)

Wood (2019)	External validation, comparison of ARISCAT with Gupta pulmonary risk index	Southern United States	Head and neck surgery	794	Median 62 years	Male 519 (65.4%)	Post-operative pneumonia (PNA) and postoperative respiratory failure (PORF).	104 (13.1%)	NR
Nithiuthai (2021)	External validation ARISCAT in elderly Thai patients	Thailand	Abdominal surgery	1,100	mean age 73.6 years	48.5% male	The PPCs complied with the European Perioperative Clinical Outcome definitions of 2015 (Jammer et al. 2015)	85 (7.7%)	<ul style="list-style-type: none"> • Non-PPC group: median score 32 (18 to 41; 95% CI, 31.1 to 32.7) • PPC group: 41 (34 to 52; 95% CI, 40.2 to 46.1)
Sousa Menezes (2021)	External validation ARISCAT	Portugal	Head and neck surgery	128	Mean 62.6 years	Male 106 (82.8%)	Respiratory complications, not further defined.	Low risk group: 4/87 (4.6%) Intermediate risk group: 12/41 (29.3%)	Mean score 16.2 ± 10.3, range 0 to 39
Kokotovic (2022)	External validation ARISCAT in a Danish cohort	Denmark	Emergency abdominal surgery	585	Median 70 years	Male 299 (51.1%)	Respiratory infection, respiratory failure, pleural effusion, atelectasis, pneumothorax, bronchospasm and aspiration pneumonitis	211 (36.1%)	NR
The STARSurg Collaborative and TASMAR Collaborative (2022)	External validation, comparison of six prediction models	United Kingdom, Ireland, and Australia	Major abdominal surgery	11,591 patients	NR	NR	According to the StEP-COMPAC definition: atelectasis [radiological evidence], pneumonia [US Centers for Disease Control definition], acute respiratory distress syndrome [Berlin consensus definition], and pulmonary aspiration [clear clinical history with radiological evidence].	903 (7.8%)	NR

Liu (2023)	Development and internal validation of new model and comparison with ARISCAT in elderly patients ²	China	Non-cardiac or non-thoracic surgery	9,775 (2,933 in validation cohort)	<ul style="list-style-type: none"> • 65–75 years: 2,342 • 76–84 years: 514 • ≥85 years: 77 	1,510 (51.48%)	Composite of atelectasis, pneumonia, respiratory failure and aspiration pneumonia	221 (7.53%)	NR
------------	---	-------	-------------------------------------	------------------------------------	---	----------------	---	-------------	----

¹ *The number of patients who experienced at least one PPC.*

² *Comparing the performance of a newly developed model with the performance of an existing model in an internal validation cohort (when a dataset is randomly divided into a development and validation subset) is an inappropriate comparison. The newly developed model will almost always outperform the existing model because the new model was developed with data from the same cohort. The direct comparison between two prediction models should be done in an external validation dataset independent of both model development cohorts (Ramspek, 2020). Therefore only the outcomes for the external validation of the ARISCAT model are reported.*

IQR = interquartile range, NR = not reported