Table SI. PubMed database search strategy.

| No. | Search query | Results |
|---|---|---|
| 1 | ((((("Infant, Premature"[Mesh]) OR ((((((((((Infant, Premature[Title/Abstract]) OR (Infants, Premature[Title/Abstract])) OR (Premature Infant[Title/Abstract])) OR (Premature Infants[Title/Abstract])) OR (Preterm Infants[Title/Abstract])) OR (Infant, Preterm[Title/Abstract])) OR (Infants, Preterm[Title/Abstract])) OR (Preterm Infant[Title/Abstract])) OR (Neonatal Prematurity[Title/Abstract])) OR (Prematurity, Neonatal[Title/Abstract]))) OR (("Infant, Extremely Premature"[Mesh]) OR ((((((((((((Infant, Extremely Premature[Title/Abstract]) OR (Extremely Premature Infant[Title/Abstract])) OR (Infants, Extremely Premature[Title/Abstract])) OR (Premature Infant, Extremely[Title/Abstract])) OR (Premature Infants, Extremely[Title/Abstract])) OR (Extremely Premature Infants[Title/Abstract])) OR (Extremely Preterm Infants[Title/Abstract])) OR (Extremely Preterm Infant[Title/Abstract])) OR (Infant, Extremely Preterm[Title/Abstract])) OR (Infants, Extremely Preterm[Title/Abstract])) OR (Preterm Infant, Extremely[Title/Abstract])) OR (Preterm Infants, Extremely[Title/Abstract]))))) AND ((("Retinopathy of Prematurity"[Mesh]) OR (((((((Retinopathy of Prematurity[Title/Abstract]) OR (Prematurity Retinopathies[Title/Abstract])) OR (Prematurity Retinopathy[Title/Abstract])) OR (Retrolental Fibroplasia[Title/Abstract])) OR (Fibroplasia, Retrolental[Title/Abstract])) OR (Fibroplasias, Retrolental[Title/Abstract])) OR (Retrolental Fibroplasias[Title/Abstract]))) OR (("Retinal Diseases"[Mesh]) OR (((Disease, Retinal[Title/Abstract]) OR (Diseases, Retinal[Title/Abstract])) OR (Retinal Disease[Title/Abstract])))))) AND ((((C-statistic[Title/Abstract]) OR (C statistic[Title/Abstract])) OR ((((((Area Under Curves[Title/Abstract]) OR (Curve, Area Under[Title/Abstract])) OR (Curves, Area Under[Title/Abstract])) OR (Under Curve, Area[Title/Abstract])) OR (Under Curves, Area[Title/Abstract])) OR (AUC[Title/Abstract]))) OR ("Area Under Curve"[Mesh])) | 68 |

Table SII. Web of Science database search strategy.

| No. | Search query | Database | Results | Date Run |
|---|---|---|---|---|
| 1 | Infant, Premature (Topic) OR Infants, Premature (Topic) OR Premature Infant (Topic) OR Premature Infants (Topic) OR Preterm Infants (Topic) OR Infant, Preterm (Topic) OR Infants, Preterm (Topic) OR Preterm Infant (Topic) OR Neonatal Prematurity (Topic) OR Prematurity, Neonatal (Topic) and Preprint Citation Index (Exclude – Database) | All Databases | 74741 | Thu Apr 17 2025 17:16:36 GMT+0800 |
| 2 | Infant, Extremely Premature (Topic) OR Extremely Premature Infant (Topic) OR Infants, Extremely Premature (Topic) OR Premature Infant, Extremely (Topic) OR Premature Infants, Extremely (Topic) OR Extremely Premature Infants (Topic) OR Extremely Preterm Infants (Topic) OR Extremely Preterm Infant (Topic) OR Infant, Extremely Preterm (Topic) OR Infants, Extremely Preterm (Topic) OR Preterm Infant, Extremely (Topic) OR Preterm Infants, Extremely (Topic) and Preprint Citation Index (Exclude – Database) | All Databases | 6381 | Thu Apr 17 2025 17:18:40 GMT+0800 |
| 3 | Retinopathy of Prematurity (Topic) OR Prematurity Retinopathies (Topic) OR Prematurity Retinopathy (Topic) OR Retrolental Fibroplasia (Topic) OR Fibroplasia, Retrolental (Topic) OR Fibroplasias, Retrolental (Topic) OR Retrolental Fibroplasias (Topic) and Preprint Citation Index (Exclude – Database) | All Databases | 6021 | Thu Apr 17 2025 17:19:50 GMT+0800 |
| 4 | Retinal Diseases (Topic) OR Disease, Retinal (Topic) OR Diseases, Retinal (Topic) OR Retinal Disease (Topic) and Preprint Citation Index (Exclude – Database) | All Databases | 79598 | Thu Apr 17 2025 17:20:36 GMT+0800 |
| 5 | Area Under Curve (Topic) OR Area Under Curves (Topic) OR Curve, Area Under (Topic) OR Curves, Area Under (Topic) OR Under Curve, Area (Topic) OR Under Curves, Area (Topic) OR AUC (Topic) and Preprint Citation Index (Exclude – Database) | All Databases | 190735 | Thu Apr 17 2025 17:21:24 GMT+0800 |
| 6 | #1 OR #2 and Preprint Citation Index (Exclude – Database) | All Databases | 74741 | Thu Apr 17 2025 17:22:17 GMT+0800 |
| 7 | #3 OR #4 and Preprint Citation Index (Exclude – Database) | All Databases | 83527 | Thu Apr 17 2025 17:22:41 GMT+0800 |
| 8 | #6 AND #7 and Preprint Citation Index (Exclude – Database) | All Databases | 3786 | Thu Apr 17 2025 17:22:58 GMT+0800 |
| 9 | #8 AND #5 and Preprint Citation Index (Exclude – Database) | All Databases | 112 | Thu Apr 17 2025 17:23:08 GMT+0800 |

Table SIII. Embase database search strategy.

| No. | Search query | Results |
|---|---|---|
| 15 | #13 AND #14 | 299 |
| 14 | #7 OR #8 | 461587 |
| 13 | #9 AND #12 | 18213 |
| 12 | #10 OR #11 | 458726 |
| 11 | #5 OR #6 | 16645 |
| 10 | #3 OR #4 | 457920 |
| 9 | #1 OR #2 | 357317 |
| 8 | “area under the curve”/exp OR “area under the curve” OR ((“area”/exp OR area) AND under AND the AND (“curve”/exp OR curve)) OR “area under curve”:ti,ab,kw OR auc:ti,ab,kw OR (auc:ti,ab,kw AND “area under the curve”:ti,ab,kw) OR “area under the curve”:ti,ab,kw | 461587 |
| 7 | “area under the curve”/exp | 233,257 |
| 6 | “retrolental fibroplasia”/exp OR “retrolental fibroplasia” OR (retrolental AND (“fibroplasia”/exp OR fibroplasia)) OR “prematurity retinopathy”:ti,ab,kw OR “retinopathy of prematurity”:ti,ab,kw OR “retrolental dysplasia”:ti,ab,kw OR “retrolental fibrosis”:ti,ab,kw OR “retrolenticular fibroplasia”:ti,ab,kw OR “retrolental fibroplasia”:ti,ab,kw | 16645 |
| 5 | “retrolental fibroplasia”/exp | 14551 |
| 4 | “retina disease”/exp OR “retina disease” OR ((“retina”/exp OR retina) AND (“disease”/exp OR disease)) OR “retinal diseases”:ti,ab,kw OR “retina disease”:ti,ab,kw | 457920 |
| 3 | “retina disease”/exp | 373916 |
| 2 | “prematurity”/exp OR prematurity OR “birth premature”:ti,ab,kw OR “infant, premature”:ti,ab,kw OR “infant, premature, diseases”:ti,ab,kw OR “neonate, premature”:ti,ab,kw OR “pre-mature birth”:ti,ab,kw OR “pre-mature infant”:ti,ab,kw OR “pre maturity”:ti,ab,kw OR “pre-term babies”:ti,ab,kw OR “pre-term baby”:ti,ab,kw OR “pre-term birth”:ti,ab,kw OR “pre-term child”:ti,ab,kw OR “pre-term infant”:ti,ab,kw OR “pre-term infants”:ti,ab,kw OR “pre-term neonate”:ti,ab,kw OR “pre-term neonates”:ti,ab,kw OR “pre-term newborn”:ti,ab,kw OR “pre-term newborns”:ti,ab,kw OR premature:ti,ab,kw OR “premature babies”:ti,ab,kw OR “premature baby”:ti,ab,kw OR “premature birth”:ti,ab,kw OR “premature child”:ti,ab,kw OR “premature childbirth”:ti,ab,kw OR “premature infant”:ti,ab,kw OR “premature infant disease”:ti,ab,kw OR “premature infant diseases”:ti,ab,kw OR “premature infants”:ti,ab,kw OR “premature neonate”:ti,ab,kw OR “premature neonates”:ti,ab,kw OR “premature newborn”:ti,ab,kw OR “premature newborns”:ti,ab,kw OR “premature syndrome”:ti,ab,kw OR prematuritas:ti,ab,kw OR prematurities:ti,ab,kw OR “preterm babies”:ti,ab,kw OR “preterm baby”:ti,ab,kw OR “preterm birth”:ti,ab,kw OR “preterm child”:ti,ab,kw OR “preterm infant”:ti,ab,kw OR “preterm infants”:ti,ab,kw OR “preterm neonate”:ti,ab,kw OR “preterm neonates”:ti,ab,kw OR “preterm newborn”:ti,ab,kw OR “preterm newborns”:ti,ab,kw OR prematurity:ti,ab,kw | 357317 |
| 1 | “prematurity”/exp | 152995 |

Table SIV. Cochrane Library database search strategy.

| No. | Search query | Results |
|---|---|---|
| 1 | MeSH descriptor: [Infant, Premature] explode all trees | 5,665 |
| 2 | (Infants, Premature):ti,ab,kw OR (Premature Infant):ti,ab,kw OR (Premature Infants):ti,ab,kw OR (Preterm Infants):ti,ab,kw OR (Infant, Preterm):ti,ab,kw | 17343 |
| 3 | (Infants, Preterm):ti,ab,kw OR (Preterm Infant):ti,ab,kw OR (Neonatal Prematurity):ti,ab,kw OR (Prematurity, Neonatal):ti,ab,kw | 14093 |
| 4 | #1 OR #2 OR #3 | 18036 |
| 5 | MeSH descriptor: [Infant, Extremely Premature] explode all trees | 438 |
| 6 | (Extremely Premature Infant):ti,ab,kw OR (Infants, Extremely Premature):ti,ab,kw OR (Premature Infant, Extremely):ti,ab,kw OR (Premature Infants, Extremely):ti,ab,kw OR (Extremely Premature Infants):ti,ab,kw | 1,049 |
| 7 | (Extremely Preterm Infants):ti,ab,kw OR (Extremely Preterm Infant):ti,ab,kw OR (Infant, Extremely Preterm):ti,ab,kw OR (Infants, Extremely Preterm):ti,ab,kw OR (Preterm Infant, Extremely):ti,ab,kw | 1048 |
| 8 | Preterm Infants, Extremely | 1302 |
| 9 | #5 OR #6 OR #7 OR #8 | 1656 |
| 10 | MeSH descriptor: [Retinal Diseases] explode all trees | 6986 |
| 11 | (Disease, Retinal):ti,ab,kw OR (Diseases, Retinal):ti,ab,kw OR (Retinal Disease):ti,ab,kw | 3800 |
| 12 | #10 OR #11 | 9215 |
| 13 | MeSH descriptor: [Retinopathy of Prematurity] explode all trees | 528 |
| 14 | (Prematurity Retinopathies):ti,ab,kw OR (Prematurity Retinopathy):ti,ab,kw OR (Retrolental Fibroplasia):ti,ab,kw OR (Fibroplasia, Retrolental):ti,ab,kw OR (Retrolental Fibroplasias):ti,ab,kw | 1666 |
| 15 | MeSH descriptor: [Area Under Curve] explode all trees | 8902 |
| 16 | (Area Under Curves):ti,ab,kw OR (Curve, Area Under):ti,ab,kw OR (Curves, Area Under):ti,ab,kw OR (Under Curve, Area):ti,ab,kw OR (Under Curves, Area):ti,ab,kw | 36877 |
| 17 | AUC | 25039 |
| 18 | #13 OR #14 | 1666 |
| 19 | #15 OR #16 OR #17 | 45831 |
| 20 | #4 OR #9 | 18150 |
| 21 | #12 OR #13 OR #14 | 10303 |
| 22 | #20 AND #21 | 1212 |
| 23 | #22 AND #19 | 21 |

Table SV. Study characteristics.

| No. | First author(s), year | Country | Research type | Research object | Data source | Sample size | Number of events | (Refs.) |
|---|---|---|---|---|---|---|---|---|
| 1 | Filho *et al,* 2009 | Brazil | Prospective cohort study | Premature infants with birth weight of ≤1,500 g and a gestational age of ≤32 weeks who were admitted from October 2002 to November 2007 | NICU, Porto Alegre Clinical Hospital, Porto Alegre, Brazil | 317 | ROP in 98 cases (30.9%) | (21) |
| 2 | Filho *et al*,2009 | Brazil | Prospective cohort study | Premature infants with extremely low birth weight and who underwent retinopathy screening, and who survived from their first ophthalmological examination to when their corrected gestational age reached 45 weeks. | NICU of Hospital de Clínicas de Porto Alegre, Porto Alegre, Brazil | 304 | ROP in 80 cases (26.3%) | (22) |
| 3 | Badriah *et al,* 2012 | Indonesia | Retrospective study | Premature infants with a gestational age of <37 weeks and a weight of ≤2,000 g who were admitted from January 2005 to August 2010 | Neonatal Ward of Cipto Mangunkusumo Hospital, Jakarta, Indonesia | 269 | ROP in 32 cases (11.9%) | (23) |
| 4 | Kemper *et al,*2015 | United States, Canada | Prospective cohort study | Infants with a birth weight of <1,251 g who were admitted from 2011 to 2013 and underwent ophthalmic examinations at post-menstrual age of 32-40 weeks | A total of 12 clinical centers (11 in the United States, 1 in Canada) | 1,239 | ROP in 124 infants (10.0%) | (24) |
| 5 | Owen *et al,* 2017 | United States | Retrospective cohort analysis | Premature infants who received ROP screening from 2010 to 2015 | NICU at the University of Utah, Salt Lake City, USA | 457 | ROP in 240 cases (52.5%) | (25) |
| 6 | Gerull *et al,* 2018 | Switzerland | Observational cohort study | In the Swiss Neonatal Network database, there were 6,719 infants born between 2006 and 2015 with a gestational age < 32 weeks at birth | Swiss National Premature Birth Registration System, nationwide, Switzerland | 6,719 | ROP in 76 cases (1.1%) | (26) |
| 7 | Cerda *et al,*2019 | United States | Retrospective study | Infants registered at the Ophthalmology ROP Registry of the University of Colorado School of Medicine from January 2006 to December 2017 that met the 2013 ROP screening criteria and survived until the first ROP examination | Ophthalmology, University of Colorado School of Medicine, Aurora, Colorado, USA | 1,301 | Severe ROP in 132 cases (10.1%) | (27) |
| 8 | Park *et al,* 2019 | South Korea | Retrospective cohort study | Singleton preterm infants born from June 2004 to September 2016, with a gestational age of 24-32 weeks that survived until the postmenstrual age of 36 weeks, underwent ROP screening and had umbilical cord blood plasma samples for analysis | Bundang Hospital of Seoul National University, Seongnam, Gyeonggi-do, South Korea | 110 | ROP in 30 cases (27.3%) | (28) |
| 9 | Ying *et al,* 2019 | United States, Canada | Retrospective cohort study | Infants who underwent ROP examinations from January 2006 to December 2011 with known ROP outcomes | Infant medical data from 29 hospitals North America | 7,483 | ROP in 3,224 cases (43.1%) | (29) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 10 | Woo *et al,* 2020 | South Korea | Retrospective cohort study | From June 2004 to July 2018 singleton preterm infants (gestational age, 23-32 weeks) that underwent amniocentesis, survived to the post-menstrual age of 36 weeks and underwent ROP screening | Bundang Hospital of Seoul National University, Seongnam City, South Korea | 175 | ROP in 50 cases (28.6%) | (30) |
| 11 | Fekri *et al,*2021 | Iran | Cross-sectional study | Premature infants with a gestational age <34 weeks and/or a birth weight of ≤2,000 referred to Alavi Hospital from October 2018 to October 2019 | Alavi Hospital, Tehran, Iran | 400 | ROP in 107 cases (26.8%) | (31) |
| 12 | Wang *et al,* 2021 | China | Diagnostic test research | Premature infants who underwent ROP screening in four centers from November 2010 to November 2019 | Shantou University and The Chinese University of Hong Kong, in collaboration with Shantou International Eye Center, Yuexiu Branch and Panyu Branch of Guangdong Women and Children"s Hospital, Sixth Affiliated Hospital of Guangzhou Medical University and Qingyuan People"s Hospital | 14,108 | ROP in 6,967 cases (49.4%) | (32) |
| 13 | Yu *et al,* 2021 | United States | Retrospective study | Infants who participated in the G-ROP-1 and G-ROP-2 studies from 2006 to 2017, underwent ROP screening and had known ROP outcomes | Multicenter cohort studies in the United States and Canada (G-ROP-1 and G-ROP-2) | 11,463 | ROP in 677 cases (5.9%) | (33) |
| 14 | Blue *et al,* 2022 | United States | Case-control study | Singleton newborns with a birth weight in the <10th percentile of the same gestational age from 2006 to 2011, and without major congenital malformations or chromosomal abnormality | Nulliparous Pregnancy Outcomes Study: Data from eight centers, USA | 865 | ROP in 7 cases (0.8%) | (34) |
| 15 | Hellström *et al,* 2022 | Sweden | Retrospective observational cohort study | Live births in the NICU of Skane University Hospital in Sweden from 2009 to 2015 with a gestational age <30 weeks | Skane University Hospital, Lund, Sweden | 385 | ROP in 104 cases (27.0%) | (35) |
| 16 | Wu *et al,* 2022 | China | Retrospective prognostic study | Infants who underwent ROP screening at Zhujiang Hospital and the Second People"s Hospital of Nanning from June 2017 to August 2019 | Zhujiang Hospital of Southern Medical University (Guangzhou, China) and the Second Nanning People"s Hospital (Nanning, China) | 815 | ROP in 208 cases (25.5%) | (36) |
| 17 | Lawrence *et al,* 2022 | Hong Kong, China | Retrospective cohort study | Premature infants who underwent ROP screening at Prince of Wales Hospital from January 2006 to December 2018, and infants who underwent ROP screening at Queen Mary Hospital in Hong Kong from January 2014 to December 2017 | Prince of Wales Hospital and Queen Mary Hospital, Hong Kong, China | 1,043 | ROP in 329 cases (40.8%) | (37) |
| 18 | Song *et al,* 2023 | South | Retrospective | From June 2004 to June 2020, singleton preterm | Bundang Hospital of Seoul | 111 | ROP in 29 cases | (38) |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Korea | single-center cohort study | infants hospitalized in the NICU, with a gestational age of 24-32 weeks that no notable chromosomal or structural congenital abnormality | National University, Seongnam City, South Korea | | (26.1%) |
| 19 | Song *et al,* 2023 | South Korea | Retrospective cohort study | From June 2004 to April 2019, singleton preterm infants with a gestational age ranging from 24 to 32 weeks born at Bundang Hospital of Seoul National University that survived until 36 weeks post-menstrual age with no notable congenital malformation, who underwent ROP screening, with peripheral blood samples collected from mothers upon admission | Bundang Hospital of Seoul National University, Seongnam, South Korea | 140 | ROP in 36 cases (25.7%), |
| 20 | Chen *et al*, 2024 | China | Retrospective study | From March 2003 to September 2023, infants with a birth weight of <1,533 g or a gestational age of <32 weeks that underwent routine ROP screening at Shenzhen Eye Hospital | Shenzhen Eye Hospital, Shenzhen, China | 22,569 | ROP in 3,335 cases (14.8%) |
| 21 | Kubota *et al,* 2024 | Japan | Retrospective study | Infants born at Osaka Women and Children"s Hospital from August 2009 to January 2019, with a gestational age of <30 weeks that underwent ROP screening | Osaka Women and Children"s Hospital, Osaka, Japan | 350 | ROP in 83 cases (23.7%) |
| 22 | Lin *et al,* 2023 | United States | Retrospective cohort study | Infants born from January 2011 to October 2022, with a gestational age of ≤32 weeks, and with ≥25 days of complete data on oxygen inhalation concentration and blood oxygen saturation available in the electronic health record | Oregon Health & Science University Electronic Health Record Data Warehouse, Portland, Oregon, USA | 230 | ROP in 87 cases (37.8%) |
| 23 | Liu *et al,* 2024 | China | Retrospective study | Infants diagnosed with ROP in the NICU of The Second Affiliated Hospital of Wenzhou Medical University and Yuying Children"s Hospital from January 2015 to December 2020 (some used as training and the internal validation group), and infants diagnosed with ROP at Taizhou Women and Children"s Hospital from January 2020 to August 2021 (external validation group) | The Second Affiliated Hospital of Wenzhou Medical University (Wenzhou), Yuying Children"s Hospital (Wenzhou), and Taizhou Women and Children"s Hospital (Taizhou), China | 554 | ROP in 74 cases (12.8%) |
| 24 | Wu *et al*, 2024 | China | Retrospective study | Infants born from September 2014 to September 2018 with a birth weight of <2,000 g, a gestational age of <32 weeks or risk factors recognized by neonatologists, who underwent complete ROP screening examination | Zhujiang Hospital of Southern Medical University (Guangzhou, China) and Second People"s Hospital of Nanning City (Guangxi, China) | 591 | ROP in 193 case (32.7%) |
| 25 | Zhao *et al,* 2024 | China | Retrospective case-control | Infants born from November 2016 to November 2021, with a birth weight of ≤1,500 g and | Children"s Hospital Affiliated to Zhengzhou University, Zhengzhou, | 237 | ROP in 79 case (33.3%) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | study | gestational age of ≤32 weeks. Infants with severe ROP were the case group; infants without ROP at any stage were the control group (matched at a ratio of 1:2 based on gestational age and birth weight) | China | | | |
| 26 | Hari *et al,* 2025 | United States | Retrospective case-control study | Born from January 2006 to December 2014, with a gestational age ≤32 weeks and hemodynamically significant patent ductus arteriosa, defined as very low birth weight (<1,500 g) preterm infants with an arterial ductus diameter of ≥1.5 mm and a left atrial/aortic ratio of ≥1.4, as examined by echocardiography | John H. Strogue Hospital, Chicago, USA | 90 | ROP in 42 case (46.7%) | (46) |
| 27 | Shi *et al,* 2025 | China | Retrospective study | Premature infants admitted to the NICU from June 2022 to December 2022, including 49 cases in ROP group and 49 cases in the non-ROP group (similar in gestational age and birth weight to the ROP group) | The Second Xiangya Hospital of Central South University, Changsha, China | 98 | ROP in 49 case (50.0%) | (47) |
| 28 | Takeda *et al,*2025 | Japan | Observational study | Newborns screened in four neonatal care units from October 2016 to September 2018 | Yamagata University Hospital (Yamagata City), Yamagata Central Hospital (Yamagata City), Yamagata Jisei Hospital (Yamagata City), and Shonai Hospital (Tsuruoka City), Yamagata Prefecture, Japan | 215 | ROP in 43 cases (20.0%) | (48) |

ROP, retinopathy of Prematurity; NICU, neonatal intensive care unit.

Table SVI. Prediction model characteristics.

| No. | First author(s), year | Modeling method | Model validation | Calibration method | AUC | 95% CI lower limit | 95% CI upper limit | Significant influencing factors | (Refs.) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Filho *et al,* 2009 | Logistic regression analysis | Not mentioned | Not mentioned | 0.630 | 0.495 | 0.761 | Birth weight; any stage of ventricular hemorrhage | (21) |
| 2 | Filho *et al,* 2009 | Logistic regression analysis | Not mentioned | Not mentioned | 0.620 | 0.550 | 0.700 | Birth weight; gestational age; weight gain from birth to 6 weeks; oxygen use during mechanical ventilation; ventricular hemorrhage; sepsis; blood transfusion | (22) |
| 3 | Badriah *et al*, 2012 | Logistic regression analysis | Not mentioned | Hosmer-Lemeshow goodness of fit statistic | 0.922 | 0.867 | 0.976 | Birth weight ≤1,000 g; gestational age ≤28 weeks; oxygen therapy ≥7 days | (23) |
| 4 | Kemper *et al,* 2015 | Logistic regression analysis | External verification | Not mentioned | 0.850 | 0.840 | 0.870 | Gestational age; postmenstrual age; previous eye examination results; ethnicity | (24) |
| 5 | Owen *et al,* 2017 | Logistic regression analysis | Not mentioned | Not mentioned | 0.864 | / | / | Gestational age; birth weight; any surgical requirements; maternal magnesium prevention | (25) |
| 6 | Gerull *et al*, 2018 | Logistic regression analysis | External verification | Not mentioned | 0.916 | / | / | Gestational age; Z-score of birth weight; continuous positive airway pressure ventilation >3 days; multiple pregnancies; use of surfactants; days of oxygen supplementation and mechanical ventilation | (26) |
| 7 | Cerda *et al,* 2019 | Logistic regression analysis | / | / | 0.916 | / | / | Weight gain; Z-score of growth curve | (27) |
| 8 | Park *et al,* 2019 | Logistic regression analysis | / | Hosmer-Lemeshow test | 0.840 | 0.728 | 0.953 | Umbilical cord blood IL-6 level is elevated; umbilical cord blood C5a level is elevated; low birth weight | (28) |
| 9 | Ying *et al,* 2019 | Logistic regression analysis | Not mentioned | Not mentioned | 0.870 | 0.860 | 0.880 | Lower birth weight; smaller gestational age; 1-min Apgar score <4; Caucasians; born outside the hospital; intubation in the delivery room | (29) |
| 10 | Woo *et al,* 2020 | Logistic regression analysis | Not mentioned | Not mentioned | 0.731 | 0.643 | 0.818 | Increased levels of endothelial glycoprotein; endostatin; IGFBP-2, IL-6 and IL-8 in amniotic fluid; low gestational age; birth weight; mechanical ventilation; use of surfactants; early-onset neonatal sepsis; respiratory distress syndrome; bronchopulmonary dysplasia; necrotizing enterocolitis; very low birth weight; small for gestational age infants; low 5-min Apgar score (<7 points) | (30) |
| 11 | Fekri *et al,* 2021 | Logistic regression analysis | Not mentioned | Not mentioned | 0.799 | / | / | Birth weight; gestational and maternal age; mode of delivery; gestational diabetes and hypertensive disorder; clinical chorioamnionitis; premature rupture of | (31) |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | membranes; prenatal use of corticosteroids; multiple pregnancies; sex | |
| 12 | Wang *et al,* 2021 | Deep learning | Internal verification | Label smoothing | 0.998 | 0.997 | 0.999 | Condition of the posterior pole retina | (32) |
| 13 | Yu *et al*, 2021 | Logistic regression analysis | Not mentioned | Not mentioned | 0.890 | 0.880 | 0.900 | Birth weight; gestational age; male; White and Hispanic ethnicity; born outside the hospital; The Apgar score was below 4 at one minute after birth; intubation in the delivery room; oxygen therapy >7 days | (33) |
| 14 | Blue *et al,* 2022 | Logistic regression analysis | Internal verification | Decile-based calibration assessment | Model 1, 0.720; model 2, 0.840 | Model 1, 0.670; model 2, 0.800 | Model 1, 0.760; model 2, 0.880 | BMI; stress; diastolic blood pressure; anesthetic use; uterine artery pulsation index; preterm birth and preeclampsia in the early stage of pregnancy | (34) |
| 15 | Hellström *et al*, 2022 | Logistic regression analysis | Not mentioned | Not mentioned | 0.870 | 0.860 | 0.880 | Low fetal hemoglobin in the first week after birth; gestational age; birth weight; small for gestational age infants; sex | (35) |
| 16 | Wu *et al,* 2022 | Deep learning | Internal verification and external verification | Calibration diagram | 0.900 | 0.880 | 0.920 | Birth weight; gestational age; blood transfusion using red blood cells; oxygen use during mechanical ventilation; respiratory distress syndrome; cesarean section; intracranial hemorrhage | (36) |
| 17 | Lawrence *et al,* 2022 | Logistic regression analysis | External verification | Not mentioned | 0.902 | 0.870 | 0.934 | Birth weight; gestational age | (37) |
| 18 | Song *et al,* 2023 | Logistic regression analysis | External verification | Hosmer-Lemeshow test | 0.770 | 0.675 | 0.865 | Decreased levels of TGFBI and endoglin in umbilical cord blood; birth weight; low gestational age; mechanical ventilation; use of surfactants; low 5-min Apgar score; respiratory distress syndrome; bronchopulmonary dysplasia | (38) |
| 19 | Song *et al,* 2023 | Logistic regression analysis | Not mentioned | Hosmer-Lemeshow test | 0.854 | 0.751 | 0.957 | Increased maternal plasma levels of LBP and IL-6; lower gestational age at sampling and birth; birth weight; high serum CRP concentration | (39) |
| 20 | Chen *et al*, 2024 | Logistic regression analysis, decision tree and multi-layer perceptron | Internal verification | Not mentioned | 0.833 | / | / | Birth weight; gestational age; sex; mode of delivery; number of fetuses | (40) |
| 21 | Kubota *et al*, 2024 | Logistic regression analysis | / | / | 0.830 | 0.780 | 0.860 | Birth weight; gestational age | (41) |
| 22 | Lin *et al,* 2023 | SVM and LSTM | Internal verification | Five-fold cross-validation evaluation | LSTM (GA) : 0.860 | / | / | Birth weight; gestational age | (42) |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | SVM (GA) : 0.890 | | | | |
| 23 | Liu *et al,* 2024 | Logistic regression analysis | Internal verification and external verification | Calibration diagram | 0.725 | 0.648 | 0.801 | Birth weight, multiple pregnancies | (43) |
| 24 | Wu *et al,* 2024 | Neural network model | External verification | Not mentioned | 0.857 | 0.770 | 0.943 | Gestational age; birth weight; cesarean section; 5-min Apgar score; bronchopulmonary dysplasia; respiratory distress syndrome; intracranial hemorrhage; hypoxic-ischemic encephalopathy; mechanical ventilation; blood transfusion; necrotizing enterocolitis; ductus arteriosus | (44) |
| 25 | Zhao *et al,* 2024 | SVM and LSTM | Not mentioned | Not mentioned | 0.716 | 0.633 | 0.799 | Blood lactate levels 1 week post-birth; clinical chorioamnionitis; low Apgar score | (45) |
| 26 | Hari *et al,* 2025 | Logistic regression analysis | Not mentioned | Not mentioned | 0.957 | 0.910 | 1.000 | Severe patent ductus arteriosus; low gestational age and birth weight, prolonged mechanical ventilation and oxygen supplementation; low body temperature on admission | (46) |
| 27 | Shi *et al,* 2025 | Logistic regression analysis | Not mentioned | Not mentioned | 0.962 | 0.930 | 0.995 | Systolic blood pressure; red blood cell count; hemoglobin; direct and total bilirubin | (47) |
| 28 | Takeda *et al*, 2025 | Machine learning | Internal verification | Not mentioned | Random forest model, 0.930; naive Bayes model, 0.940 | Random forest model, 0.830; naive Bayes model, 0.860 | Random forest model, 0.990; naive Bayes model, 0.990 | Gestational age; birth weight; 1- and 5-min Apgar score; mechanical ventilation; use of surfactants; respiratory distress syndrome; patent ductus arteriosus; use of indomethacin for treatment of patent ductus arteriosus; blood transfusion; clinical chorioamnionitis | (48) |

s“/, not mentioned in the literature; Performance metric uses AUC, with values ≥0.8 indicating good discriminative ability, consistent with standard clinical evaluation criteria. SVM, support vector machine; LSTM, long short-term memory; VEGF, vascular endothelial growth factor; AUC, area under the receiver operating characteristic curve; CI, confidence interval; IGFBP, insulin-like growth factor binding protein; CRP, C-reactive protein; GA, genetic algorithm; LBP, Lipopolysaccharide-Binding Protein; IL-6, Interleukin-6; TGFBI, Transforming Growth Factor Beta-Induced Protein; C5a, Complement Component 5a.