

EVIDENCE TABLE

for Clinical Indicators of Severity in Pneumonia

Clinical question: Do individual clinical indicators correlate with severity of pneumonia? Study authors and year	Study Design	Participants	Exposure/ Comparison	Outcomes	Results					Quality Scores
					EER	CER	RR	RD	NNT	
Campbell, 1989	Cohort of children prospect ive	500 X 0-4 years age Gambian children Assessed by field workers 222 episodes of LRTI 81 (38%) CXR abnormal	Assessment of RR, feeding, fever, nasal faring, stridor, systemic upset Which best predictor of LRTI confirmed by physician, and in smaller number confirmed by CXR	Fever > 38.5, Vomiting, refusal to feed, RR > 60/min best correlation Intercostal recession, nasal flaring or crepitations not good correlation	Comment: Slightly different findings from other studies Rural					Φ
Harari 1991	Cross section, prosecti ve	Outpatient clinic Papua New Guinea Rural villages Age 8 weeks to 6 years 185 children 1 st 95 assessed regardless of	Tachypnea, chest in-drawing, specific RR, breathless, nasal flaring, age < 24 months, fever, sleeping poorly, crepitations, temperature >38, feeding poorly, cough > 2 days	RR > 50/min + indrawing best predictors of pneumonia More complex definition (RR with age) no added benefit 30% had xray evidence of pneumonia			RR >50 Positive predictor power 46%, Negative predictor 83%			Φ

		RR, next 90 studied if RR > 40/min	Excluded wheeze, stridor, measles, pertussis All CXR							
Leventhal, 1982	X section, Prospective	Paed emerg room, New Haven Over 6 month pneumonia DX by CXR Qre completed before doctor knew CXR result	Which parameter best predicted abnormal CXR 136 kids, 3 months to 15 years 186 others by Qre not complete – no difference	Pneumonia Dx in 26 (19%) Tachypnea best single predictor of LRTI, and abnormal Xray cluster = respiratory distress, tachypnoea, rales, decreased breath sounds p < 0.001 cluster = sick appearance, cough, respiratory distress, tachypnoea, rales, decreased breath sounds p < 0.001						Φ Small numbers by time got to interested group Wide age range
Madico 1995	X section, prospective	Outskirts Lima – well children RR Ped emerg dept, Lima Peru Hypoxia < 96.6%	Compare oxim to WHO algorithm to pick LRTI, pneumonia, xray confirmed pneumonia Definitions of URTI, LRTI, Pneumonia & xray pneumonia on summary	Well children RR see summary but even in young children 50/min mean 160/269 (59%) had pneum mean sat 93.8%+ nonpneum mean sat 98.7% Oxim detected 88%, WHO 90% pneum Both detected 72% CXR pneum Together detected						Φ Not sure about divisions – lots of overlap Hypoxia defined higher here WHO identified all LRTI as did

				99% Pneumonic LRTI, 87% of xray pneumonia Pulse oxim misclassified 4%, WHO misclassified 35%						oxim, but over diagnose d
Margolis, 1998 Paper also started with a review of literature but most also here ** I will review this again before teleconference – I may have misexamined it	X section, Prospect ive	56 Children North Carolina	Examined by pair of physicans Agreement of physical signs	Agreement good for most observed signs (attentiveness, smiling, quality of cry, physical appearance & movement, colour, work of breathing) Agreement fair for auscultation (prolonged expiratory phase, adventitious sounds, inspiratory wheezing) Agreement good for audible wheeze, expiratory wheeze Agreement good for presence or absence rather than severity of findings. RR counted over 30 secs average 2- 4/min faster than counted over 60 secs More accurate if counted over 30 seconds twice & averaged						+
Mulholland, 1992	X section,	Manila, Phillipines	Identical protocol	In Phillipines RR or indrawing sens 81%,						+ when

	Prospective	=368 kids Mbabane, Swaziland = 362 kids all < 5 years Wheezing excluded	RR > 50/min 2 to 12 months, 40 > 12 months to 5 years Clinical assess 1 doctor Dx pneumonia by 2 nd doctor with a CXR Also assessed by nurse with 1 day training of parameters	specificity 77% for predicting pneumonia In Swasiland sensitivity 77%, specificity 81% Health workers same sensitivity but reduced specificity Missed cases had less intercostal wall recession, less fever Intercostal indrawing only were older 19 months compared to 9 months and less likely to be severe History of prior antibiotic use Manila 27% Mbabane 5% Diff breathing Manila 37% Mbab 29% Paed Dx 102 pneumonia in Manila, 26 in Mbabane						applied in realistic settings – WHO good sens, spec ? such a diff in Dx rate
Palafox, 2000	X section, Prospective	Gen hosp, Mexico 3 days – 5 yrs	clinical dx pneumonia CXR = infiltrates or consolidation study child matched with next child seen with resp infection but not pneumonia RR observed for a minute	Best sole clinical sign Tachypnoea sens 74%, spec 69%, 23% false positives, 8% false negatives alveolar rales sens 46%, spec 79% combination of alveolar rales, tachypnea, chest indrawing sens <46% but specificity 80-84% no variation in sens & spec with age In children low						+ good study

				weight for age more sens but less spec In children within 3 days of disease onset lower sens and spec compared with later clinical judgement of defined paed identified pneumonia in 62% of all cases						
Singhi, 1994	X section, Prospective	Paed emerg or OP dept India infants with cough, runny nose with fever, or fever without any other systemic systems	CXR in all – pneumonia defined Assessed parameters likely to predict pneumonia	101 pneumonia 150 URTI RR>60/min sens 85%, spec 97% Indrawing sens 85%, spec 97% Plus 4 other signs = feeding, sick, temp, abdo distn sens 92%, spec 75% Plus nasal flare sens 92%, spec 97% 5 infants would have been missed						+ ROC curve suggests RR.50/min most sens indicator
Taylor, 1995	X section, Prospective	Emerg dept, Seattle < 2 yrs age	RR – what level predicts abnormal CXR Dx pneumonia Excluded wheezing or stridor RR over 60 seconds	572 kids, Pneum in 123 xray changes in 41 agreement by radiol 0.55 defined age RR RR sens 73.8%, spec 76.8%, pos pred value 20.1%, neg pred value 97.8%						+ small numbers by time of xray

Comments:

Really good studies – but it all depends how they defined their positive pneumonias – CXR not a good way of predicting if only positive 1/3 of time