

Table

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EVIDENCE TABLE

For Pulse Oximetry in Bronchiolitis & Pneumonia

Clinical question: Does pulse oximetry offer any advantage as an addition to clinical assessment?

Study authors and year	Study Design	Participants	Exposure/ Comparison	Outcomes	Results					Quality Scores
					EER	CER	RR	RD	NNT	
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 99% Pneumonic LRTI, 87% of xray pneumonia Pulse oxim misclassified 4%, WHO misclassified 35%						⊕ Not sure about divisions – lots of overlap Hypoxia defined higher here WHO identified all LRTI as did oxim, but over diagnosed
Maneker 1995	X section Prospective	Urban univ hospital in States 368 kids < 8yrs with	Oximetry measured Hypoxia = <92% Which	Doctors picked low sats in 23 of 69 patients Single clinical parameters;						+

		<p>resp illness</p> <p>16% <6/12s 59% 7-36 months age</p> <p>variety Dx including asthma, bronchiolitis, pneumonia</p>	<p>parameters predict low saturation</p>	<p>clinical = sens 33%, spec 86%</p> <p>retractions = sens 88%, spec 40%</p> <p>tachypnea = sens 80%, spec 35%</p> <p>wheezes = sens 80%, spec 36%</p> <p>decreased aeration = sens 52%, spec 64%</p> <p>rales = sens 31%, spec 75%</p> <p>flaring = sens 25%, spec 83%</p> <p>grunting = 7%, spec 97%</p> <p>Combinations of parameters; retractions or wheezes = sens 98.5%, spec 20%</p> <p>retractions or tachypnea = sens 98.5%, spec 24%</p> <p>tachypnea or wheezes = sens 97%, spec 15%</p> <p>decreased aeration or retractions = sens 92%, spec 33%</p> <p>decreased aeration or tachypnea = sens 89%, spec 29%</p> <p>retractions or clinical assessment of low = sens 88%, spec 39%</p> <p>Change in Mx 91% in unexpected group vs 43% expected Admit 28% unexpected, 4% known</p>						
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				O2 commenced in 82% unexpected, vs 39% known						
Mower 1997	X section Prospekt	Emerg dept Uni hospital USA < 18 yrs age 2602 305 OXM<95%	Change in Mx following oximetry measurement	82 additional tests 39 new TxS 5 then admitted Compared to 1822 >95% 12 additional tests 22 new TxS 5 then admitted Physicans most likely to change when satn 89-92%						0 older children excellent study "oximetry 5 th paed sign"
Onyango 1993	X section Prospekt Observational	Paed casualty ward, Kenya at altitude 256 children <3 years age	Clinical parameters correlation of hypoxia Hypoxia <90% 151 hypoxia	RR >70/min best predictor of hypoxia Hypoxia predicted CXR abnormality sens 71%, spec 55% Mortality 10% Only 11% hypoxic children thought to be cyanosis		RR 4.3 mort with hypoxia RR 1.03 xray pneumonia				0 normal had mean 95.7% high mortality only few <2months
Rajesh 2000	X section Prospekt	200 infants emerg hospital Hehru + Chandiargh India mean age 28 days resp infection	RR that predicts hypoxiaRR	pneumonia 34%, bronchiolitis2%, septicaemia 12%, meningitis 6%, heart failure3.8 %, birth asphyxia 8%, acute gastroenteritis 2.5%, URTI 3.8% 77/200 hypoxia Negative correlation between RR and oximetry (1= -0.39, p < 0.001) RR of 60/min = 80.5% sens, 68% spec, positive predictive value 61, negative predictive						0 lots Dx good in 2 centers

				value 85%						
Kneyber 2001	X section Prospective Multivariate analysis	OP or admission 1 st set derived factors 232 children dx with RSV CXR 202 2 nd set tested 55, RSV pos, 93% CXR	Abnormal CXR Which clinical factors predict Xray = normal vs abnormal	Normal = Increased postnatal age, high birthweight, rhinitis, no retractions, high O2						+ no info in interobserver reliability
Dele Davies 1996	X section Prospective blinded	Tertiary, paed hospital 3 radiologists on 2 occasions 40 CXR of 148 infants	CXR predictive of LRTI in infants 40 xrays 25 pneumonia 15 bronchiolitis	Within observer agreement = 0.85, 0.76, 0.87, 0.86, 0.91 Between observer agreement = 0.83, 0.55, 0.82, 0.78, 0.79						+
Friss 1990	X section	Hosp admission Within 24 hours admission 128 children	Respiratory cultures cf CXR 37 bac + viral 39 viral 25 bac 27 nil	33% viral normal xrays only small number of other groups had normal xray lobar pneumonia found in RSV pos < 6 months age xrays not helpful in sorting out viral from bacterial						+