



How to change practice in Australasian EDs

Ed Oakley
Emergency Physician
Royal Children's Hospital Melbourne

Bronchiolitis: Burden of disease



PREDICT research

Bronchiolitis Management in Paediatric Emergency Departments in Australia and New Zealand: A PREDICT Study

Babl, Franz E, Sheriff, Nisa, Neutze, Jocelyn, Borland, Meredith, Oakley, Ed.
Pediatric Emergency Care 2008;**24**(10):656-658 **IF:1.1**

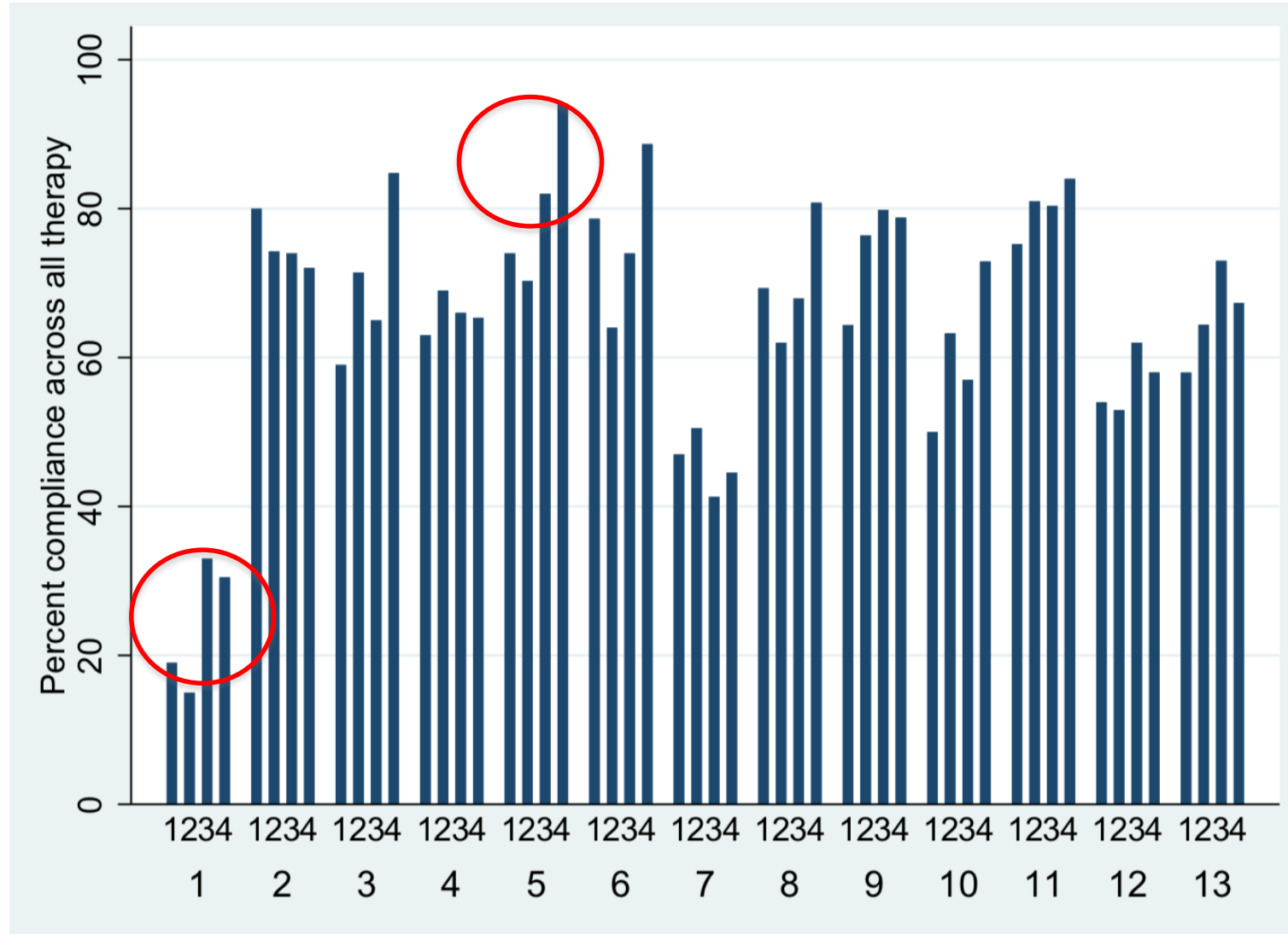
Medication use in infants admitted with bronchiolitis

Oakley E; Brys T; Borland M; Neutze J; Phillips N; Krieser D; Dalziel SR; Davidson A; Donath S; Jachno K; South M; Williams A; Babl FE;
Paediatric Research in Emergency Departments International Collaborative (PREDICT).
Emergency Medicine Australasia. 30(3):389-397, 2018

MedicaPractice variation in acute bronchiolitis

Schuh S, Babl FE, Dalziel S, *etal*
Pediatrics. 40(6):, 2017

Bronchiolitis: Variation in practice



Bronchiolitis: Variation in practice

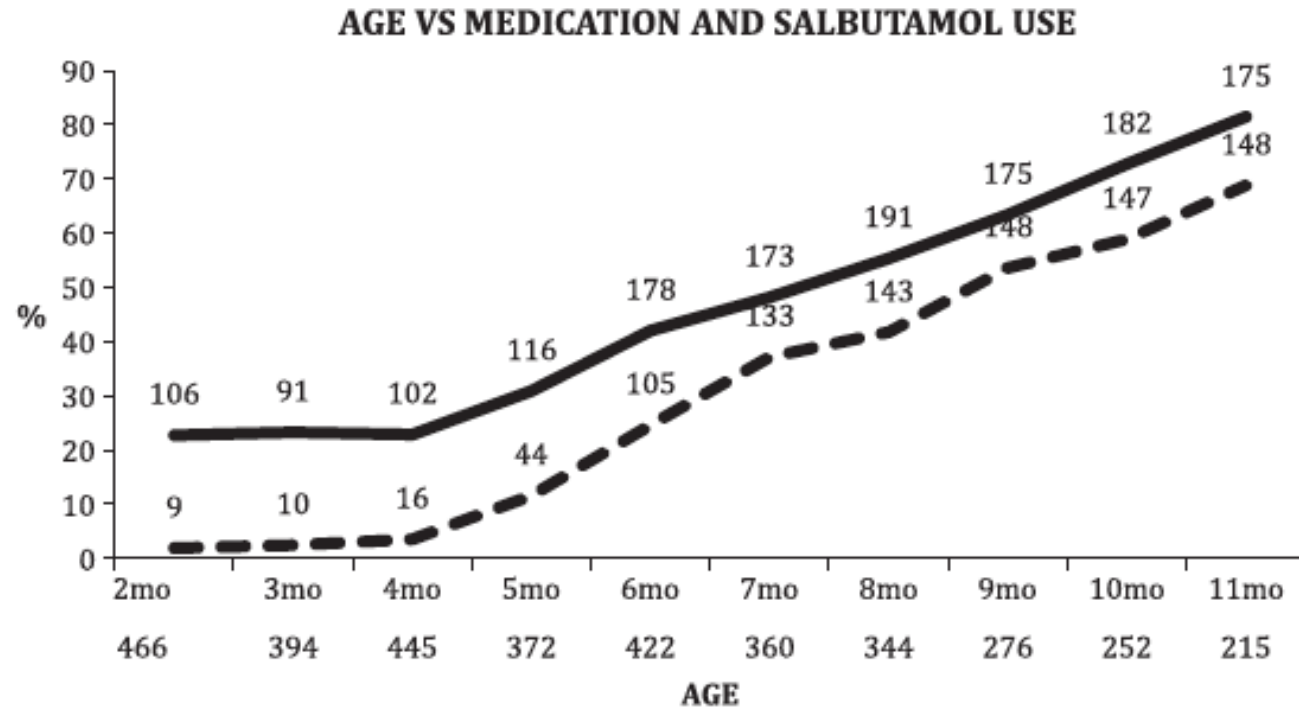


Figure 2. Medication and salbutamol use by age. mo, months. (—), Medication; (---), salbutamol.

Guidelines are “*statements that include recommendations intended to optimize patient care that are informed by a systematic review of evidence and an assessment of the benefits and harms of alternative care options*”

Institute of Medicine



Bronchiolitis: Local guidance


Journal of Paediatrics and
Child Health



doi:10.1111/jpc.14104

ORIGINAL ARTICLE

Australasian bronchiolitis guideline

Sharon O'Brien,^{1,2} Meredith L Borland,^{1,3} Elizabeth Cotterell,⁴ David Armstrong,^{5,6} Franz Bahl ^{7,8,9}, Paul Bauert,¹⁰ Christine Brabyn,¹¹ Lydia Garside,¹² Libby Haskell,¹³ David Levitt,¹⁴ Nicola McKay,¹⁵ Jocelyn Neutze,¹⁶ Andreas Schibler,^{14,17,18} Kam Sinn,¹⁹ Janine Spencer,²⁰ Helen Stevens,²¹ David Thomas,²² Michael Zhang,²³ Ed Oakley,^{8,9,24,25} and Stuart R Dalziel;^{13,26,27} on behalf of the Paediatric Research in Emergency Departments International Collaborative (PREDICT) Network, Australasia



Paediatric Research in
Emergency Departments
International Collaborative

Bronchiolitis: Local guidance


Journal of Paediatrics and
Child Health



doi:10.1111/jpc.14104

ORIGINAL ARTICLE

Australasian bronchiolitis guideline

Sharon O'Brien,^{1,2} Meredith L Borland,^{1,3} Elizabeth Cotterell,⁴ David Armstrong,^{5,6} Franz Babl ,^{7,8,9} Paul Bauert,¹⁰ Christine Brabyn,¹¹ Lydia Garside,¹² Libby Haskell,¹³ David Levitt,¹⁴ Nicola McKay,¹⁵ Jocelyn Neutze,¹⁶ Andreas Schibler,^{14,17,18} Kam Sinn,¹⁹ Janine Spencer,²⁰ Helen Stevens,²¹ David Thomas,²² Michael Zhang,²³ Ed Oakley,^{8,9,24,25} and Stuart R Dalziel,^{13,26,27} on behalf of the Paediatric Research in Emergency Departments International Collaborative (PREDICT) Network, Australasia

Do not use beta-2 agonists (GRADE strong)

Do not use adrenaline (GRADE strong)

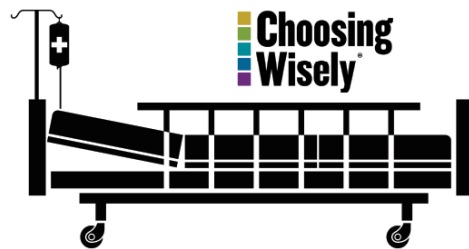
Do not use glucocorticoids (GRADE strong)

Do not use antibiotics (GRADE conditional)

Routine CXR **not recommended** (GRADE conditional)



Bronchiolitis: Local guidance



Bronchiolitis: Knowledge translation

A wide-angle photograph of a deep, layered canyon, likely the Grand Canyon, with a river flowing through the bottom. The canyon walls are composed of distinct horizontal rock layers, showing significant erosion. The river is a light, milky color, winding through the center of the canyon. The sky is a clear, bright blue. The overall scene is arid and majestic.

What is
known

What is
currently
done

Bronchiolitis: Knowledge translation

Haskell et al. *BMC Pediatrics* (2018) 18:218
<https://doi.org/10.1186/s12887-018-1187-7>


BMC Pediatrics

STUDY PROTOCOL

Open Access



Implementing evidence-based practices in the care of infants with bronchiolitis in Australasian acute care settings: study protocol for a cluster randomised controlled study

Libby Haskell^{1,2*} , Emma J. Tavender^{3,4}, Catherine Wilson³, Sharon O'Brien⁵, Franz E. Babl^{3,6,7}, Meredith L. Borland^{5,8}, Liz Cotterell^{9,10}, Tibor Schuster^{3,11}, Francesca Orsini^{3,11}, Nicolette Sheridan¹², David Johnson¹³, Ed Oakley^{3,6,7}, Stuart R. Dalziel^{1,2} on behalf of PREDICT¹⁴

KT bronchiolitis study

Aim

To determine whether

tailored, theory informed KT intervention

vs.

passive guideline dissemination

improves compliance with the Australian Bronchiolitis Guideline (CXR, antibiotics, adrenaline, glucocorticoids and salbutamol)

Haskell et al. *BMC Pediatrics* (2018) 18:218
<https://doi.org/10.1186/s12887-018-1187-7>

BMC Pediatrics

STUDY PROTOCOL

Open Access

Implementing evidence-based practices in the care of infants with bronchiolitis in Australasian acute care settings: study protocol for a cluster randomised controlled study



Libby Haskell^{1,2*}, Emma J. Tavender^{3,4}, Catherine Wilson³, Sharon O'Brien⁵, Franz E. Babi^{3,6,7}, Meredith L. Borland^{5,8}, Liz Cotterell^{9,10}, Tibor Schuster^{3,11}, Francesca Orsini^{3,11}, Nicolette Sheridan¹², David Johnson¹³, Ed Oakley^{3,6,7}, Stuart R. Dalziel^{1,2} on behalf of PREDICT¹⁴



KT bronchiolitis study

Methods

- Multi-centered cluster RCT
- Comparing a tailored, theory informed KT intervention to passive dissemination of a bronchiolitis guideline
- KT interventions designed following qualitative interviews using the Theoretical Domains Framework to identify key factors influencing bronchiolitis management

Haskell et al. *BMC Pediatrics* (2018) 18:218
<https://doi.org/10.1186/s12887-018-1187-7>

BMC Pediatrics

STUDY PROTOCOL

Open Access

Implementing evidence-based practices in the care of infants with bronchiolitis in Australasian acute care settings: study protocol for a cluster randomised controlled study



Libby Haskell^{1,2*}, Emma J. Tavender^{3,4}, Catherine Wilson³, Sharon O'Brien⁵, Franz E. Babl^{3,6,7}, Meredith L. Borland^{5,8}, Liz Cotterell^{9,10}, Tibor Schuster^{3,11}, Francesca Orsini^{3,11}, Nicolette Sheridan¹², David Johnson¹³, Ed Oakley^{3,6,7}, Stuart R. Dalziel^{1,2} on behalf of PREDICT¹⁴

KT bronchiolitis study

Site inclusion

- ED census >135 cases per year
- *Be willing to participate in control or intervention*
- Signed consent by ED and pediatric inpatient clinical directors
- Ability to audit clinical notes
- Nominate a clinical lead for duration of study

Site exclusion

- Inability to audit clinical notes
- *Be averse to participating if randomised to control*

KT bronchiolitis study - Primary outcome

Compliance or non-compliance during the first 24hrs following presentation to ED



KT bronchiolitis study – Secondary outcomes

- Compliance or non-compliance for each key therapy
 - While in ED
 - While an inpatient
 - During acute care period (first 24hours)
 - During total hospitalization
- Length of stay
- Death or ICU admissions

KT bronchiolitis study – Data extraction

- Retrospective
- Randomized cases (n=100-150/year)
 - <1 year old
 - ED and final diagnosis bronchiolitis
- Intervention year (2017) + 2 years prior
- Statistics: 90% power to show an absolute difference of 15%



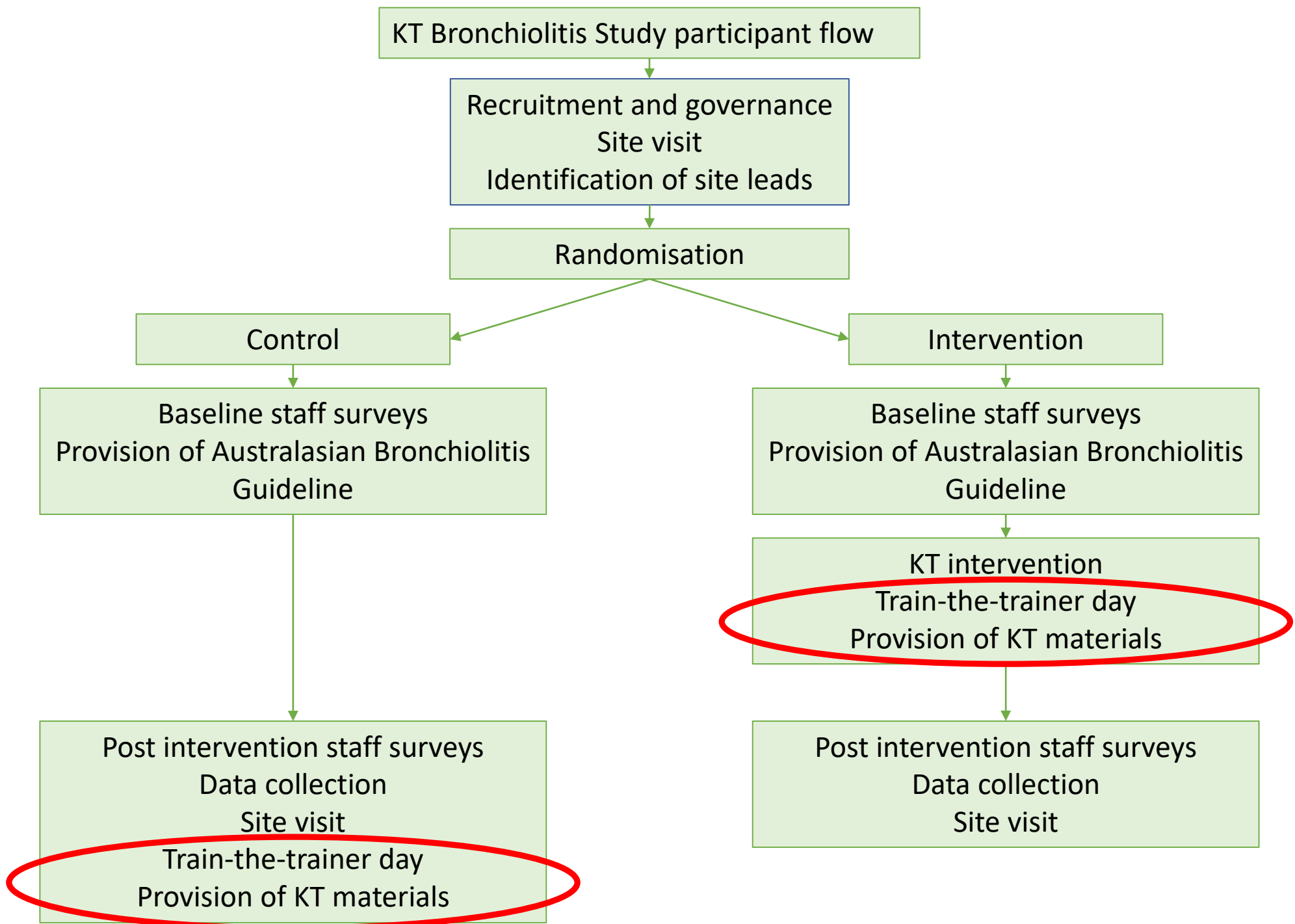
KT bronchiolitis study - Sites



6



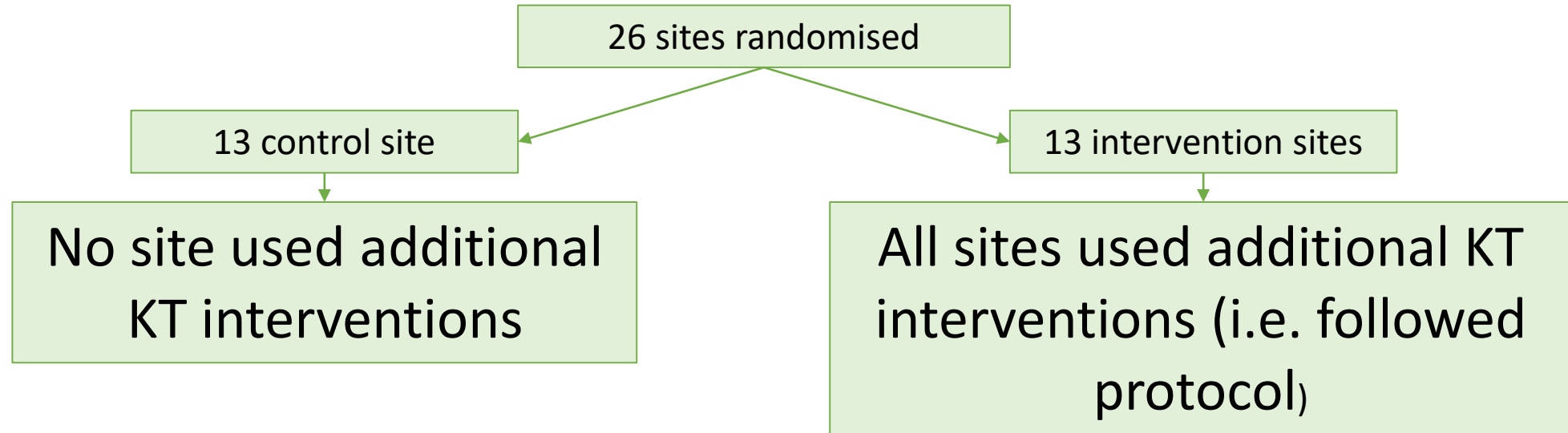
20



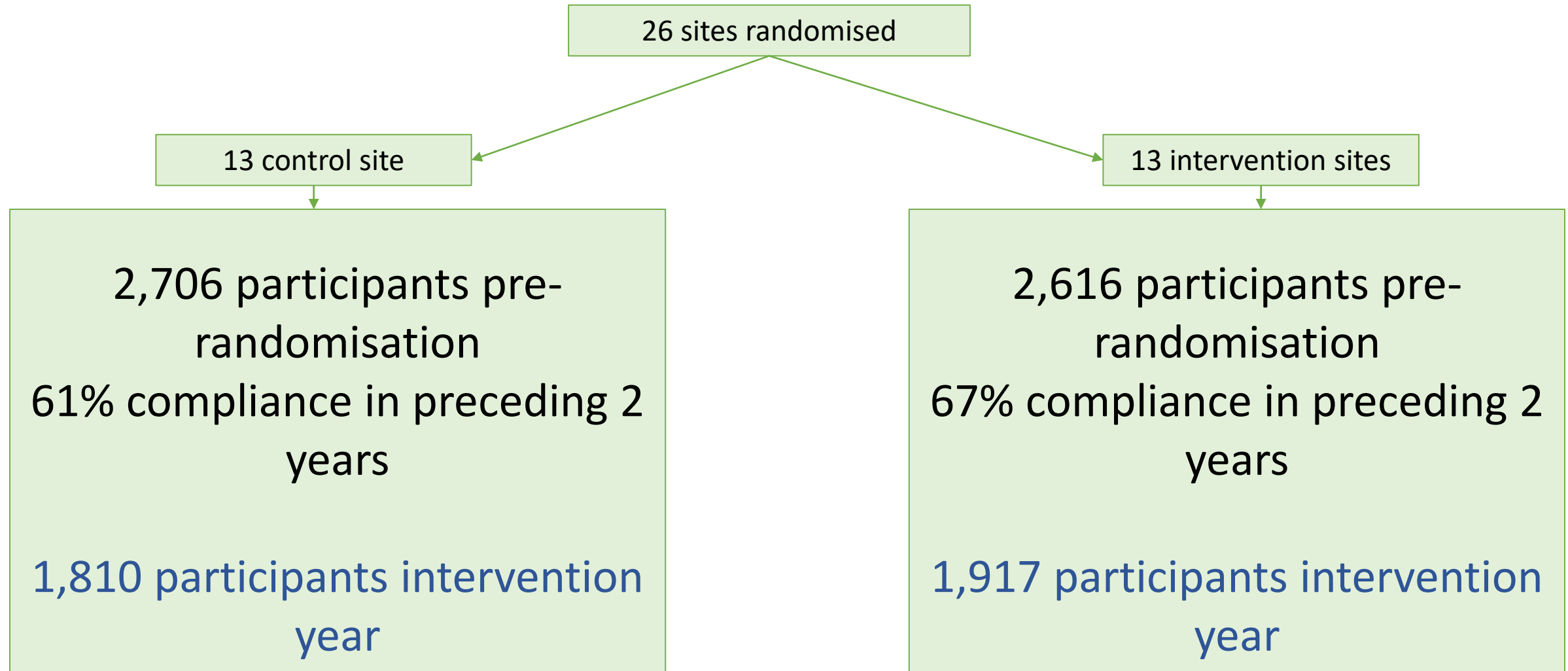
KT bronchiolitis study – Interventions

All interventions	Control site	Intervention site
Electronic and printed copy of: - Complete Australasian Bronchiolitis Guideline - Summarised bedside clinical guideline	✓	✓
Stake-holder meeting to create buy-in		✓
Four clinical leads (nursing and medical, from ED and inpatient paediatrics)		✓
One day train-the-trainer for clinical leads	✓	✓
Provision of KT training materials: - Educational power points, videos / fact sheets / posters / caregiver information sheet	✓	✓ ✓
Monthly audit and feedback site reports		✓
Support for clinical leads by key research group contact		

KT bronchiolitis study – Study flow



KT bronchiolitis study – Study flow



KT bronchiolitis study – Baseline

	Control n = 1,810	Intervention n = 1,917
Characteristics of infants included in study during intervention year		
Age - mean +/- SD, months	6.0 (SD 3.14)	5.9 (SD 3.18)
Female - no. (%)	666 (37%)	733 (38%)
Race or ethnic group – no. (%)		
Aboriginal/Torres Strait Islander (Australia)	169 (9%)	126 (7%)
Maori/Pacific Islander (New Zealand)	248 (14%)	269 (14%)
Other	1,393 (77%)	1,519 (79%)
Past medical history		
Premature birth – no. (%)	281 (16%)	224 (12%)
Hx of co-morbidities - no. (%)	90 (5%)	82 (4%)

KT bronchiolitis study – Baseline

	Control n = 1,810	Intervention n = 1,917
Characteristics of infants included in study during intervention year		
Age - mean +/- SD, months	6.0 (SD 3.14)	5.9 (SD 3.18)
Female - no. (%)	666 (37%)	733 (38%)
Race or ethnic group – no. (%)		
Aboriginal/Torres Strait Islander (Australia)	169 (9%)	126 (7%)
Maori/Pacific Islander (New Zealand)	248 (14%)	269 (14%)
Other	1,393 (77%)	1,519 (79%)
Past medical history		
Premature birth – no. (%)	281 (16%)	224 (12%)
Hx of co-morbidities - no. (%)	90 (5%)	82 (4%)

KT bronchiolitis study – Primary outcome

	Control (n=1,810)	Intervention (n=1,917)	Risk difference (95%CI)	P value
Compliance during first 24 hours with regard to chest x-ray, salbutamol, glucocorticoids, antibiotics and epinephrine	1,321 (73%)	1,631 (85%)	12.1% (6.5%-21.7%)	<0.001

KT bronchiolitis study – Primary outcome

	Control (n=1,810)	Intervention (n=1,917)	Risk difference (95%CI)	P value
Compliance in ED	1,427 (79%)	1,671 (87%)	8.8% (4.1%- 17.4%)	0.002
Compliance as inpatient	1,499 (83%)	1,735 (91%)	8.5% (2.7%- 14.3%)	0.004
Compliance during total hospitalisation	1,265 (70%)	1,576 (82%)	12.4% (6.2%- 22.6%)	<0.001

KT bronchiolitis study – Secondary outcomes

Compliance for each patient presentation during the first 24 hours following presentation to ED with regard to:	Control (n=1,810)	Intervention (n=1,917)	Risk difference (95%CI)	P value
Chest x-ray (for a respiratory cause)	1,635 (90%)	1,786 (93%)	4.0% (0.6%-8.6%)	0.05
Salbutamol	1,598 (88%)	1,825 (95%)	7.8% (4.5%-11.0%)	<0.001
Glucocorticoids	1,777 (98%)	1,891 (99%)	3.0% (0.7%-1.2%)	0.56
Antibiotics (for a respiratory cause)	1,772 (98%)	1,873 (98%)	0.5% (-1.2%-2.3%)	0.56
Epinephrine	1,807 (99%)	1,915 (99%)	0.1% (-0.2%-0.4%)	0.53

KT bronchiolitis study – Secondary outcomes

	Control (n=1,810)	Intervention (n=1,917)	IRR/RD (95%CI)	P value
Length of stay (hours) – median (IQR)	11 (2, 45)	12 (2, 42)	IRR 0.94 (0.7%-1.24%)	0.67
Death/ICU admission – n (%)	41 (2%)	63 (3%)	RD 0.38 (-0.22-0.99)	0.21

KT bronchiolitis study – Limitations

- Not possible to blind staff
- Data collected retrospectively
 - However needed to do this to avoid Hawthorne effect
- Participants needed both an ED and discharge diagnosis of bronchiolitis
 - Therefore true compliance will be lower than reported
- Smaller hospitals excluded
- Sustainability

Guidelines

- Compliance improved from 61% to 73% just with
 - Guideline
 - Local dissemination
 - Consistent wider international message
- Compliance improved to 85% with
 - Tailored KT intervention



Conclusion

- High quality Guidelines can improve care
- Good KT will maximise reward
- But effort should be worth potential benefit