Table S1: Individual Subject Data and Appearance in Figures/Tables. Individual subjects are listed with key demographic data. Appearance in figures and tables denoted by shaded boxes.

Subject #	Group	Age (years)	Sex	Virus	Fig 1	Fig 2	Fig 3	Fig 4	Fig 5	Fig 6	Fig S1	Fig S2	Fig S3	Table 1	Table 2
NIV 102	Noninvasive Ventilation	2.00	F	RSV		▓	▓					▓		▓	▓
NIV 103		0.58	F	HMPV		▓	▓					▓		▓	▓
NIV 105		1.17	F	Adenovirus and Rhino/Enterovirus		▓	▓					▓		▓	▓
NIV 108		0.13	M	RSV		▓	▓					▓		▓	▓
NIV 109		0.06	F	Rhino/Enterovirus		▓						▓		▓	▓
NIV 110		0.50	M	RSV		▓						▓		▓	▓
NIV 111		0.17	M	RSV and Rhino/Enterovirus								▓		▓	▓
NIV 112		0.17	M	HMPV and Rhino/Enterovirus								▓		▓	▓
NIV 113		0.50	M	RSV		▓						▓		▓	▓
NIV 114		0.07	M	RSV		▓	▓					▓		▓	▓
NIV 115		0.58	F	RSV		▓	▓					▓		▓	▓
NIV 116		0.08	F	RSV		▓	▓					▓		▓	▓
NIV 117		1.75	M	RSV and Coronavirus HKU1		▓	▓					▓		▓	▓
NIV 118		0.17	F	RSV		▓	▓					▓		▓	▓
NIV 119		0.50	M	RSV and Coronavirus NL63		▓	▓					▓		▓	▓
NIV 120		0.33	M	RSV		▓	▓					▓		▓	
NIV 121		0.33	M	HMPV		▓	▓					▓		▓	
NIV 122		0.06	M	Parainfluenza 2		▓	▓					▓		▓	
NIV 123		2.00	M	Parainfluenza 2		▓	▓					▓		▓	
NIV 124*		0.75	F	RSV		▓	▓					▓		▓	
NIV 125		2.00	M	RSV		▓	▓					▓		▓	
NIV 127		0.16	F	RSV		▓						▓		▓	
NIV 129		3.00	F	RSV		▓	▓	▓				▓		▓	
NIV 130*		3.00	M	RSV		▓	▓	▓				▓		▓	
NIV 131		0.17	M	RSV		▓	▓					▓		▓	
NIV 132		0.33	M	RSV		▓	▓					▓		▓	
NIV 134		0.08	F	RSV		▓	▓					▓		▓	
NIV 135		0.92	M	RSV		▓	▓	▓				▓		▓	
NIV 136		1.50	M	RSV		▓	▓	▓				▓		▓	
NIV 137		0.75	F	RSV		▓	▓	▓				▓		▓	
NIV 140		0.17	M	Rhino/Enterovirus		▓	▓	▓				▓		▓	
NIV 143		3.00	M	Parainfluenza 1 and Rhino/Enterovirus		▓	▓	▓				▓		▓	
NIV 147		1.00	M	RSV		▓	▓	▓				▓		▓	
NIV 148		0.30	F	RSV		▓	▓	▓				▓		▓	
ETT 042	Invasive w/ PARDS	1.00	M	HMPV		▓	▓					▓		▓	
ETT 043		0.21	M	Coronavirus NL63		▓	▓					▓		▓	
ETT 046		6.00	F	RSV		▓	▓					▓		▓	
ETT 047		6.00	M	HMPV		▓	▓					▓		▓	
ETT 048		10.00	F	Rhino/Enterovirus		▓	▓					▓		▓	
ETT 083		2.00	F	Rhino/Enterovirus		▓						▓		▓	
ETT 084		0.33	M	RSV		▓						▓		▓	
ETT 088		0.17	M	RSV		▓						▓		▓	▓
ETT 090		1.00	M	HMPV	▓	▓					▓	▓	▓	▓	
ETT 103		1.00	M	RSV		▓						▓		▓	
ETT 104		0.30	M	RSV	▓	▓					▓	▓		▓	
ETT 105		1.00	F	Influenza B		▓						▓		▓	
ETT 118		0.25	F	RSV		▓	▓					▓		▓	
NIV 142		0.25	M	RSV and Coronavirus HKU1		▓	▓					▓		▓	
ETT 078	Invasive - no PARDS	2.00	M	HMPV		▓	▓					▓		▓	
ETT 081		0.67	M	HMPV		▓						▓		▓	
ETT 086		0.03	F	RSV		▓	▓					▓		▓	
ETT 095		0.83	F	Rhino/Enterovirus		▓	▓					▓		▓	
ETT 096		0.15	M	RSV		▓	▓					▓		▓	
ETT 097		1.00	M	Parainfluenza 2		▓	▓					▓		▓	
ETT 100		0.30	M	Coronavirus OC43		▓	▓					▓		▓	
ETT 106		0.30	F	RSV		▓	▓					▓		▓	
ETT 107		1.00	F	Parainfluenza 3		▓	▓					▓		▓	
ETT 108		0.67	M	Rhino/Enterovirus		▓	▓					▓		▓	
ETT 110		0.08	M	RSV		▓	▓					▓		▓	
ETT 111		0.08	M	RSV	▓	▓	▓				▓	▓		▓	
ETT 113		2.00	M	Coronavirus NL63		▓	▓					▓		▓	
ETT 116		1.50	M	Adenovirus		▓	▓			▓		▓		▓	
FLD 001		28.00	M	na						▓					
FLD 002		27.00	F	na						▓					
FLD 003		28.00	M	na						▓					
FLD 004		32.00	M	na						▓					
FLD 005		28.00	F	na						▓					
FLD 006		35.00	M	na						▓					
AUD 060		1.25	M	na						▓					
AUD 061		2.00	M	na						▓					
AUD 062		2.00	M	na						▓					
AUD 063		0.42	M	na						▓					
AUD 064		4.30	M	na						▓					

*Denotes subject meeting criteria for "At-risk PARDS", data analyzed with PARDS group

FSC-H | FSC-A | G1

CD16 | CD45 | G2

CD14 | CD206 | G3

CD123 | CD14 | Baso. | pDC | G7

CD24 | CD14 | G6 | Monocyte

SSC-A | CD14 | G4 | G5

CD16 | CD24 | Neutrophil | Mast | Eo.

HLA-DR | CD11c | DC | G8

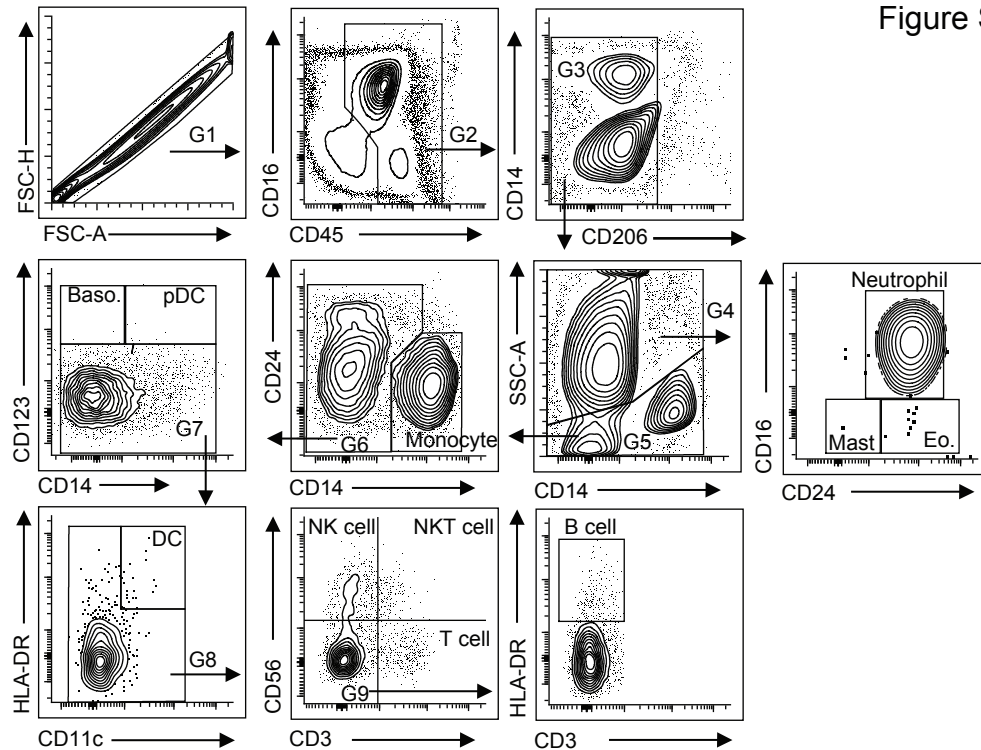CD56 | CD3 | NK cell | NKT cell | T cell | G9

HLA-DR | CD3 | B cell

Figure S1: **Myeloid Cell gating strategy.** Single cells selected by forward scatter properties (G1). Cells from G1 gated for expression of CD45$^+$ and CD16$^{+/-}$ (G2). Cells from G2 gated by CD206$^-$ and CD14$^{+/-}$ (G3). Cells from G3 shown by expression of side scatter and CD14 and gated as G4 = side scatter high, CD14$^{+/-}$ and G5 = side scatter low, CD14$^{+/-}$. Cells gated as G4 shown by expression of CD16 and CD24; Neutrophils gated as CD16$^+$ CD24$^+$, Eosinophils gated as CD16$^-$ and CD24$^+$, and Mast Cells gated as CD16$^-$ and CD24$^-$. Cells gated as G5 shown by expression of CD24 and CD14; Monocytes gated as CD14$^+$ and remaining gated as G6 = CD24$^{+/-}$ and CD14$^+$. Cells gated as G6 shown by expression of CD123 and CD14; Basophils gated as CD123$^+$ and CD14$^-$, plasmacytoid dendritic cells gated as CD123$^+$ and CD14$^+$, remaining cells (CD123$^-$ and CD14$^{+/-}$) gated as G7. Cells gated as G7 depicted by expression of HLA-DR and CD11c with Dendritic Cells gated as HLA-DR$^+$ and CD11c$^+$ with remaining cells gated as G8. Cells gated as G8 shown by expression of CD56 and CD3 with NK cells gated as CD56$^+$ and CD3$^-$, and NK T cells gated as CD56$^+$ and CD3$^+$, T cells gated as CD56$^-$ and CD3$^+$ with remaining cells gated as G9. Cells gated from G9 depicted by expression of HLA-DR and CD3 with B cells gated as HLA-DR$^+$ and CD3$^-$.
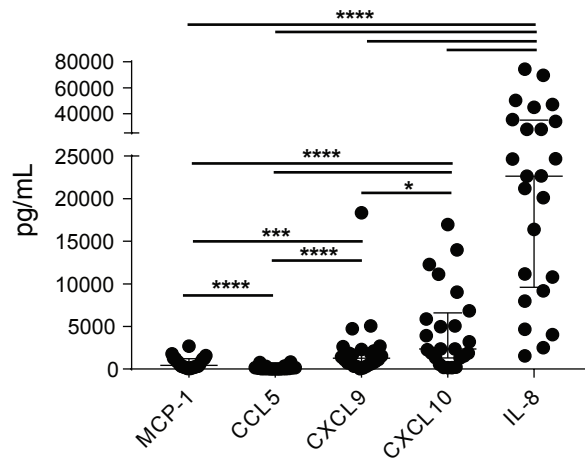
Figure S2: IL-8 is the predominant cytokine in the URT during pediatric VRTI. Graph shows chemokine concentration (pg/mL) in the URT during the first 48 hours of study enrollment compiled from 24 subjects. P values obtained by Wilcoxon matched pairs signed rank test. P values represented by *; (* = $p<0.05$, ***= $p<0.001$, ****= $p<0.0001$).
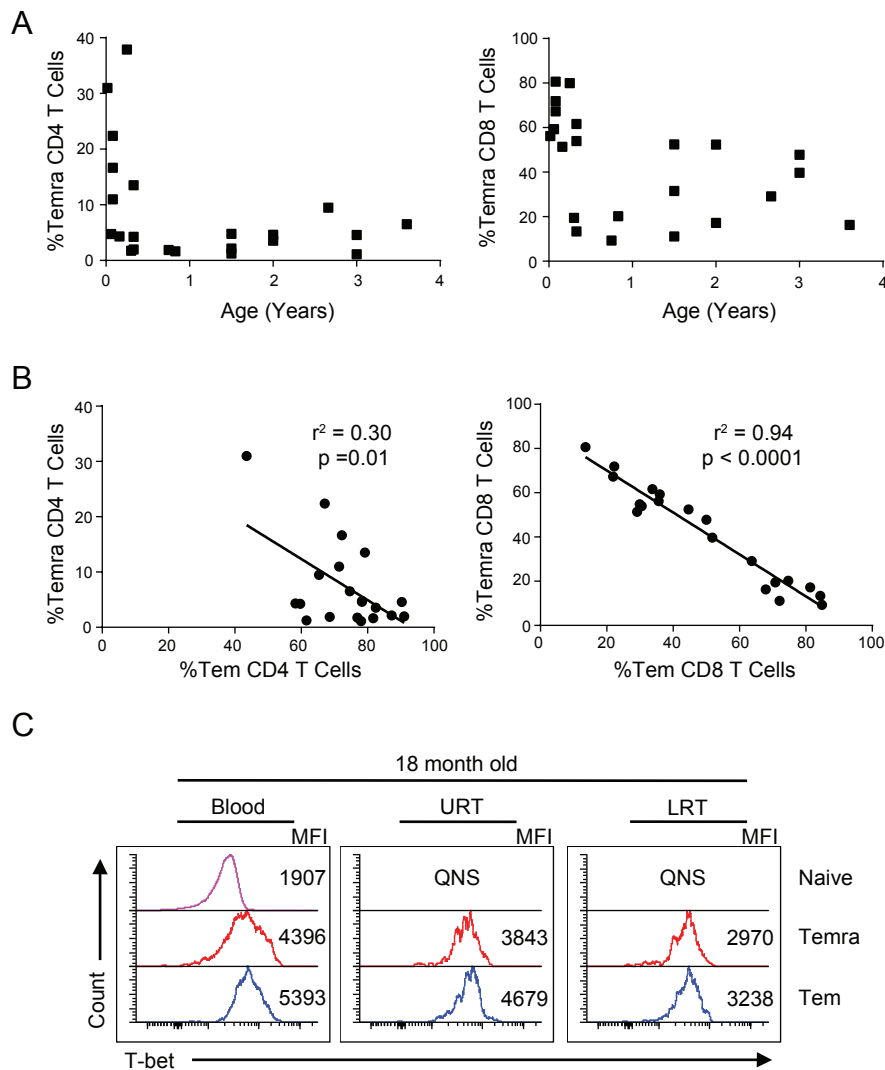
Figure S3: Characteristics of local Tem and Temra responses during VRTI. (A) Depicts

proportions of Temra cells found in the URT during VRTI as a function of subject age for CD4^{+}

(left) and CD8^{+} (right) T cells (n=20). (B) Depicts proportions of Temra (y axis) and Tem (x

axis) subsets in the URT during VRTI among CD4^{+} (left) and CD8^{+} (right) T cells (n=20).

Statistical analysis performed using linear regression. (C) Representative paired samples from a

single infected subject demonstrating expression of T-bet (x axis) with stated median

fluorescence intensity (MFI) on T cell subsets; Naïve (top), Temra (middle), and Tem (bottom).

QNS = quantity not sufficient.