STOP-ROP Effective FIO_2 Conversion Tables
For Infants on Nasal Cannula

Example*:*

What is the effective FIO_2 of a 1.5 KG Infant on 100% cannula oxygen at a flow of 0.25 LPM?

Answer: Use 1.5 KG and 0.25 LPM in table 1 to get a factor of 17. Use the factor of 17 and 100% in table 2 to get an effective FIO_2 of 0.34.

Assumptions:

The tables should be reasonably accurate for most STOP-ROP infants. Benaron and Benitz assumed that there is a constant nasal flow over the inspiratory cycle and that the upper airway does not act as a reservoir. Additional assumptions for STOPP-ROP infants include:

- Inspiration time = 0.3 seconds
- Tidal volume = 5 ml per KG body weight
- Either inspiration is entirely nasal, or cannula flow is low enough so that, on each inspiration, the infant inhales all output from the cannula.

Table 1: Factor as a function of flow and weight

FLOW	WEIGHT (KG)										
(LPM)	0.7	1	1.25	1.5	2	2.5	3	3.5	4	4.5	5.5
0.01	1	1	1	1	1	0	0	0	0	0	0
0.03	4	3	2	2	2	1	1	1	1	1	1
0.06	9	6	5	4	3	2	2	2	2	1	1
0.15	21	15	12	10	8	6	5	4	4	3	3
0.25	36	25	20	17	13	10	8	7	6	6	5
0.5	71	50	40	33	25	20	17	14	13	11	9
0.75	100	75	60	50	38	30	25	21	19	17	14
1	100	100	80	67	50	40	33	29	25	22	18
1.25	100	100	100	83	63	50	42	36	31	28	23
1.5	100	100	100	100	75	60	50	43	38	33	27
2	100	100	100	100	100	80	67	57	60	44	36
3	100	100	100	100	100	100	100	86	75	67	55

Factor = 100 * min (1, LPM/KG)

The tables are adapted from equations (3) and (4) in:

Benaron DA & Benitz WE, “Maximizing the Stability of Oxygen Delivered Via Nasal Cannula” Arch Pediatr Adolesc Med 148:294-300, March 1994.

Rule of Thumb (already implicit in the tables):

For most STOP-ROP infants, if flow (LPM) exceeds body weight (KG), then effective FIO_2 equals nasal cannula oxygen concentration.

Table 2: Effective FIO_2 (x 100) as a function of factor and concentration

Oxygen Concentration in Cannula (%)							
Factor	**21**	**22**	**25**	**30**	**40**	**50**	**100**
0	21	21	21	21	21	21	21
1	21	21	21	21	21	21	22
2	21	21	21	21	21	22	23
3	21	21	21	21	22	22	23
4	21	21	21	21	22	22	24
5	21	21	21	21	22	22	25
6	21	21	21	22	22	23	26
7	21	21	21	22	22	23	27
8	21	21	21	22	23	23	27
9	21	21	21	22	23	24	28
10	21	21	21	22	23	24	29
11	21	21	21	22	23	24	30
12	21	21	21	22	23	24	30
13	21	21	22	22	23	25	31
14	21	21	22	22	24	25	32
15	21	21	22	22	24	25	33
17	21	21	22	23	24	26	34
18	21	21	22	23	24	26	35
19	21	21	22	23	25	27	36
20	21	21	22	23	25	27	37
21	21	21	22	23	25	27	38
22	21	21	22	23	25	27	38
23	21	21	22	23	25	28	39
25	21	21	22	23	26	28	41
27	21	21	22	23	26	29	42
28	21	21	22	24	26	29	43
29	21	21	22	24	27	29	44
30	21	21	22	24	27	30	45
31	21	21	22	24	27	30	45
33	21	21	22	24	27	31	47
36	21	21	22	24	28	31	49
38	21	21	23	24	28	32	51
40	21	21	23	25	29	33	53
42	21	21	23	25	29	33	54
43	21	21	23	25	29	33	55
44	21	21	23	25	29	34	56
50	21	21	23	25	30	35	60
55	21	22	23	26	31	37	64
57	21	22	23	26	32	38	66
60	21	22	23	26	32	38	68
63	21	22	24	27	33	39	71
67	21	22	24	27	34	40	74
71	21	22	24	27	34	42	77
75	21	22	24	28	35	43	80
80	21	22	24	28	36	44	84
83	21	22	24	28	37	45	87
86	21	22	24	29	37	46	89
100	21	22	25	30	40	50	100