

Supplemental Digital Content 1. Medications administered to patients before and during surgery in control (blue) and morphine (orange) patients.

Patient #	Medical history	Regular medications	Before surgery	During surgery
1	ear swelling	-	-	fentanyl, propofol, rocuronium, lidocaine, remifentanyl, dexamethasone, ketorolac
2	tympanostomy	-	-	fentanyl, propofol, lidocaine, cefazolin, remifentanyl, ondansetron, ketorolac
3	cholesteatoma	-	-	propofol, lidocaine, rocuronium, fentanyl, morphine, remifentanyl infusion, Infumorph P/F infusion (morphine sulfate preservative/free), ondansetron, ketorolac, cefazolin
4	meningitis, hearing loss	-	lorazepam	lidocaine, propofol, remifentanyl, morphine, dexamethasone, cefazolin, ondansetron
5	polyarteritis nodosa, hepatomegaly, cholesteatoma	prednisone	-	fentanyl, propofol, cefazolin, Ventolin, dexamethasone, remifentanyl, ondansetron
6	history of cleft palate, myopia, joint hypermobility, hearing loss	-	-	remifentanyl, fentanyl, morphine, propofol, cefazolin, esmolol, ondansetron
7	hydronephrosis, asthma	-	-	propofol, lidocaine, fentanyl, remifentanyl, clindamycin, ketorolac, ondansetron
8	Otitis media, conductive hearing loss, congenital cholesteatoma	-	midazolam	propofol, fentanyl, cefazolin, ketorolac, ondansetron
9	bilateral sensorineural hearing loss	-	-	propofol, rocuronium, lidocaine, remifentanyl, cefazolin, dexamethasone, morphine, ondansetron
10	right-sided hearing loss	omeprazole	omeprazole	midazolam, fentanyl, cefazolin, rocuronium, ondansetron
11	eustachian tube dysfunction, otitis media	-	-	propofol, remifentanyl, fentanyl, ketorolac, ondansetron, dexamethasone, morphine, cefazolin
12	hearing loss	iron supplement	-	propofol, lidocaine, remifentanyl, dexamethasone, ondansetron, morphine
13	sensorineural hearing loss	-	midazolam	propofol, fentanyl, morphine, ketorolac, ondansetron, cefazolin
14	Anemia, 2 ear surgeries	-	-	propofol, fentanyl, cefazolin, dexamethasone, ondansetron, ketorolac
15	right preauricular cyst	-	-	propofol, fentanyl, ketorolac, ondansetron, cefazolin
16	sensorineural hearing loss, brain injury	-	midazolam, acetaminophen	propofol, fentanyl, remifentanyl, cefazolin, dexamethasone, ondansetron, ketorolac, hydromorphone
17	multiple infections, conductive loss	-	-	propofol, cefazolin, ketamine, fentanyl, morphine, ondansetron, dexamethasone, ketorolac
18	Conductive hearing loss	-	-	propofol, glycopyrrolate, dexmedetomidine, cefazolin, ketorolac, ondansetron, dexamethasone

Supplemental Digital Content 2. Timeline of elective surgery and study in control (blue) and morphine (orange) patients.

Patient #	Date of surgery (DD/MM/YYYY)	Time of surgery	Departure from OR	Departure from PACU	Start of PSG	Morphine administration	Duration (hours) in PACU
1	21/03/2013	8:35 AM	12:04 PM	1:05 PM	8:47 PM	11:56 PM	10.9
2	08/03/2013	2:09 PM	4:07 PM	7:00 PM	9:25 PM	10:05 PM	3.1
3	12/04/2013	9:25 AM	12:21 PM	2:00 PM	8:07 PM	11:27 PM	9.5
4	14/06/2013	3:10 PM	5:16 PM	6:15 PM	8:07 PM	12:54 AM	6.7
5	16/06/2014	11:45 AM	3:59 PM	5:00 PM	8:40 PM	11:11 PM	6.2
6	17/05/2013	12:04 PM	3:59 PM	5:00 PM	8:21 PM	1:25 AM	8.4
7	03/04/2013	9:45 AM	3:07 PM	4:45 PM	8:10 PM	11:54 PM	7.2
8	13/03/2013	9:26 AM	10:22 AM	11:45 AM	9:05 PM	10:29 PM	10.7
9	08/02/2013	10:20 AM	2:55 PM	3:45 PM	9:44 PM	11:30 PM	7.8
10	02/08/2013	8:18 AM	11:09 AM	12:15 PM	8:21 PM	10:00 PM	9.8
11	22/04/2013	8:30 AM	12:10 PM	1:30 PM	8:30 PM	11:00 PM	9.5
12	04/08/2013	9:42 AM	10:42 AM	3:25 PM	8:34 PM	11:00 PM	7.6
13	24/07/2013	8:26 AM	11:25 AM	1:00 PM	8:43 PM	11:00 PM	10.0
14	18/09/2014	1:09 PM	3:33 PM	5:35 PM	8:30 PM	11:00 PM	5.4
15	06/03/2013	8:33 AM	12:30 PM	1:30 PM	8:35 PM	11:00 PM	9.5
16	12/02/2013	2:00 PM	4:08 PM	7:01 PM	9:25 PM	11:00 PM	4.0
17	11/04/2014	12:04 PM	2:08 PM	3:50 PM	8:21 PM	11:00 PM	7.2
18	10/05/2013	9:45 AM	3:07 PM	4:45 PM	8:10 PM	11:00 PM	6.3

Abbreviations: OR, operating room. PACU, Post Anesthesia Care Unit. PSG, polysomnography.