

INTUBATION NATION

ANESTHESIA RESIDENCY PROGRAM NEWSLETTER

VOL. 4 | ISSUE 2 | SEPTEMBER 2020

Editor in Chief Jessica Reyes, MD
Editor Nicholas Nedeff, MD

Get to know our new Attending: Dr. Oded Tal.

By Jessica Reyes

Our work family here at Kendall Regional would like to welcome our newest Anesthesia attending Dr. Oded Tal. If you weren't introduced in person, or if it wasn't for his ID badge reading Physician, perhaps you may have already crossed him in the halls mistaking him for a new resident or a medical student. At 30 years young Dr. Tal is younger than most of our own residents, but don't be fooled by his youthful appearance, he comes to us fresh from residency at Mount Sinai in Manhattan, a rigorous academic institution.



Where do you hail from? What is your medical education background?

This NY native was raised in Queens, which he describes "the most culturally diverse county in the country," growing up in a suburban/urban community and attending public schools. This has prepared him well for dealing with diverse patient populations "nothing is too much of a shock in terms of culture wise for me". It wasn't until High school, when he started taking the train to the city, that he began to experience city life. There must be something about New York that he loves, because he stayed there for his undergraduate Studies at Stony Brook College where he majored in Biology, graduated from Medical school at New York Medical College, and finally completed residency at Mount Sinai in Manhattan. He is the first and only in his family to pursue a medical degree jokingly adding "it was bound to happen with a Jewish mother."

ANNOUNCEMENTS: UPCOMING EVENTS

October 2-5
ANESTHESIOLOGY 2020 Virtual Annual ASA meeting
(Free registration for Residents)

December 11-13
Resident Wellness Retreat

January 14-17, 2021
North American Neuromodulation Society (NANS) 24th Annual Meeting
(Orlando, Florida)

February 7, 2021
In Training Exam (ITE)

FEATURED ARTICLES

NEW ATTENDING

Getting to know our new
Attending, Dr. Oded Tal.

PAIN THE 5TH VITAL SIGN

A review of Postoperative
Pain Management

ASA 2020 PRESENTATIONS

Topics and Authors

ASA 2020 RESIDENT DELEGATES

Kalina Nedeff & Brian Cheung

Get to know our new Attending: Dr. Oded Tal.

If not Medicine then what?

Though he majored in biology he attempted to complete a major in art, unfortunately the premed requirements differed too greatly from the art degree curriculum. His love of the arts began in High School, which was a specialized school in art. His preferred form art is painting, preferred medium is oil paint, and favorite subjects are portraits. Dr. Tal was generous enough to share a link to some of his incredible pieces, two of many showcased here.

This begged the question “if not medicine what field could you see yourself in?” His response was somewhere in the art world, if not visual arts, then possibly culinary arts, in the restaurant industry. This led us into a rabbit hole talk of food and beer, which we will discuss later.

When did you become interested in Anesthesia?

It was in his third year of medical school rotations where through process of elimination he decided to pursue a residency in anesthesia. Initially he was interested in Urology, but lost interest in it from the clinical perspective. He comments on how happy everyone was in Anesthesia, how it felt like “all things included in one,” and he really enjoyed being in the OR. He recalls a memorable OB case during his Medical school rotation when a patient suddenly became unresponsive and in that moment he became part of team anesthesia as everyone came together to treat the patient.

What good advice did you get during residency that you would want to pass along?

“As a resident you’re really tired, there are days when you just want to do easy cases and go home, but it was put into perspective to me that as a resident you should want to do cases, because time goes by so quickly. Come CA3 year you really start to focus on your cases more, because in due time you’re going to be responsible and on your own, with the help of others, but still you’re really going to want to know what you’re doing and be confident doing it. So you should want to do cases, because you’re going to be much better off for it and be more confident. Really try to be part of interesting cases, try to do new things, really develop your skills and be comfortable with everything across the board that anesthesia is involved in.

Now that you are making an Attending salary what have you splurged on?

“I was pretty frugal as a resident, although [...] one of the good things about our program was that we got some decent money as overtime when we stayed really late, so people got the opportunity to make a little extra money which helped. In terms of advice I would say stay living frugally even as an attending. If I’m saying I’m splurging I would say it’s on sneakers and beer, because there is a lot of good beer in Florida. His two most recent acquisitions were Jordan ones, and air max ones. Since he has been living frugally the past couple of years “old nostalgic pairs” catch his eye. He adds “if residents are reading this, tell them I’m splurging on my savings, IRA, 401K all that good stuff, because they should do that too.” The good advice just keeps on coming.

Let’s talk beer and food. What are you getting into these days?

“I’ve been visiting breweries nearby, I mostly like sours, stouts, IPAs, but there’s a lot of good sours and stouts in Florida. There is a collaboration going around breweries called ‘black is beautiful’ where all the breweries are putting their own spin on a stout, and that’s been excellent.” Dr. Tal impressed me as a non-native Miamian teaching me something new about my city.

My fiancé is of Chinese Japanese background so we like to cook a lot of Asian food. What got me through Medical school was rice and beans with chicken, so I made that a lot. At this point anything that looks good. We watch endless amounts of Food TV, so we try new recipes, whatever looks good. Haven’t gone out to eat, but have been ordering out, supporting small businesses as much as we can. Food scene is better now than six years ago when I was here last.” Home town barbeque which is a NY restaurant that opened a branch here, taco stand which is excellent, and another taco place in Wynwood, close to where he lives in Midtown are a few that he mentioned.

Biggest culture shock moving from NY to Miami?

Sometimes I try and figure out what things are Florida and what things are Miami, obviously Miami is Florida, but it’s its own entity. It is a predominately Hispanic Latino culture, which I am familiar with, but haven’t been completely immersed in it. A lot of my friends are predominately Spanish speaking families, so I’ve been around it for holidays, so that isn’t entirely new to me, but in every aspect of life



Get to know our new Attending: Dr. Oded Tal.

from going to the grocery store, work, everything is Hispanic, so its stepped up. The thing I am not on par with is the way people drive here. People say that driving in NYC is crazy, but it's not like this. Everyone drives so fast!

Thoughts on the Pandemic

Sometimes I'm stressed that some people take it more seriously than others, you have to find a balance, but I would honestly say I'm a little traumatized from what we saw in NY and what was happening at work. It started to ease up by the time I was finishing up residency, and then coming down to Miami, when it was hitting here hard, kind of revisited some of those emotions, but I kind of feel like everyone else, I want it to be over with, want it to pass, and willing to make the sacrifice for things to improve. Hopefully a vaccine hits soon enough.

Is there anything else we didn't talk about that you would want us to know about you?

I always mention to other people that where I went to residency we had people we called 'Sinai Lifers' because so many people that went to residency there, stayed as an attending. It was always really interesting to work with people who were not from Sinai, because they did things a little differently, had interesting techniques and did things we weren't really comfortable with or exposed to. Since I'm the new guy I think its fun for people to learn something new. If you go somewhere outside of Miami, you may see things done differently. I am from an Academic program I like to teach, I want to teach, I want to work with the residents. I have a very open door policy, come to me any time whether is work related or not.

This was a beautiful way to end this great interview, I enjoyed getting to know our new attending, and I hope we all get a chance to talk all things anesthesia and otherwise with our new attending Dr. Tal.

PAIN THE 5TH VITAL SIGN

A review of Postoperative Pain Management

By Angela Chang

Postoperative pain generally resolves within a month but if poorly managed, it can result in adverse physiologic effects on multiple organ systems, patient dissatisfaction, a delay in recovery, and increased morbidity and mortality.

Factors that are directly associated with severity of postoperative pain include length of surgery, anxiety, opioid use, depression, obesity, and fibromyalgia.

| Complications of Untreated Postoperative Pain | |
|---|--|
| Respiratory | Atelectasis, V/Q mismatch, tachypnea, hypoxemia, hypercapnia, pneumonia |
| Cardiovascular | Hypertension, tachycardia, MI, dysrhythmias |
| Endocrine | Hyperglycemia, Na ⁺ and water retention, protein catabolism |
| Immune System | Leukocytosis, infection, poor wound healing |
| Hematology | ↓ platelet adhesiveness, ↓ fibrinolysis, hypercoagulable state ↑ DVT, PE |
| GI/GU | Ileus, urinary retention, anastomotic failure, stress ulcers |
| Psychological | Anxiety, sleep disturbances, depression |

Postoperative pain is best managed using a multimodal approach where two or more analgesic medications with different mechanisms of action are administered preoperatively, intraoperatively, and/or postoperatively. Patients undergoing thoracic, breast, and gallbladder surgeries as well as inguinal hernia repairs and amputations are at a higher risk for developing postoperative neuropathic pain.

Nociceptive pain is typically treated with a combination of opioids, NSAIDs, acetaminophen, and blocks.

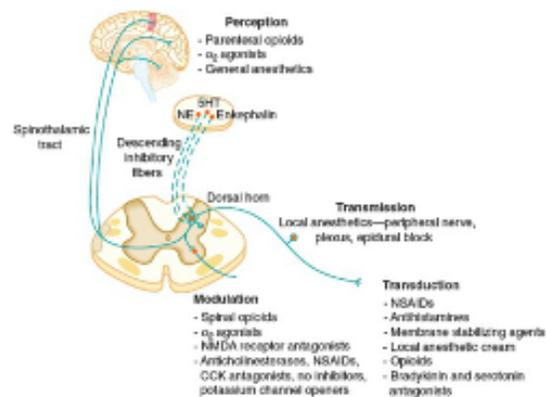
Neuropathic pain is managed with NMDA receptor antagonists, α_2 agonists, and α_2 - δ subunit calcium channel ligands.

Pain the 5th Vital Sign

Pain Processing Pathway

A successful pain regimen will target all four components of the pain processing pathway. The four processes of pain include:

- 1. Transduction:** a noxious stimulus is converted into an action potential by a peripheral nociceptor
 - Targeted by opioids, NSAIDs, and local anesthetics
- 2. Transmission:** the action potential is relayed via the dorsal root ganglion to the dorsal horn and then the thalamus
 - Targeted by local anesthetics and α_2 agonists
- 3. Modulation:** afferent neural transmission is altered along the pain pathway, typically at the dorsal horn cells
 - Targeted by opioids, α_2 agonists, NMDA receptor antagonists, NSAIDs
- 4. Perception:** nociceptive signals are integrated into the reticular, somatosensory, and limbic cortices
 - Targeted by general anesthetics, opioids, and α_2 agonists



From Barash's Clinical Anesthesia

Medications for Postoperative Pain Management

Opioid Analgesics

Opioids work by binding μ , δ , κ -opioid receptors. The analgesic effect is primarily attributed to binding of the μ -opioid receptors. Centrally, descending inhibitory pathways are activated while peripherally, nociceptive afferent neurons are inhibited, resulting in decreased transmission of nociceptive signals. General adverse effects include nausea, vomiting, sedation, respiratory depression, pruritus, ileus, constipation, urinary retention, and confusion.

- **Morphine** is the prototype opioid and is considered the “gold standard.” It undergoes hepatic glucuronidation and is eliminated by the kidneys. It takes about 20 minutes to reach peak effect and duration of action is around 4 to 5 hours. The typical dose is 1 to 3 mg IV. Adverse effects associated with the active metabolite, morphine-6-glucuronide, include somnolence, nausea, vomiting, coma, respiratory while inactive metabolite, morphine-3-glucuronide may cause agitation, myoclonus, delirium, and hyperalgesia.
- **Fentanyl** is a synthetic opioid that acts as a μ -opioid receptor agonist. It is 80-100 times more potent than morphine. It undergoes hepatic metabolism via CYP3A4 and is eliminated via urine and bile. It has an immediate onset of action and has a duration of action of 30 to 60 minutes. The typical dose is 25 to 50 μ g IV for moderate pain and up to 100 μ g IV if severe. Unlike morphine, fentanyl does not cause a release of histamine and is better in situations of hemodynamic instability. Adverse effects are similar to other opioids but may also include confusion, dizziness, headache, and dehydration.
- **Hydromorphone** is a semisynthetic opioid that is 4-6 times more potent than morphine. It is metabolized via hepatic glucuronidation to active metabolites, dihydromorphone and dihydroisomorphine, and an inactive metabolite, hydromorphone-3-glucuronide, and eliminated via urine. It reaches peak effect in approximately 10 minutes and lasts 3 to 4 hours. The typical dose is 0.2 to 0.5 mg IV. It causes less nausea, vomiting, somnolence, and pruritus than morphine, but accumulation of its inactive metabolite can cause neuroexcitation and cognitive impairment.
- **Oxycodone** is another semisynthetic opioid that is hepatically metabolized by CYP3A4 and CYP2D6 and eliminated via urine. The onset of action occurs within 60 minutes and lasts for 3 to 6 hours. The dose is anywhere from 5 to 30 mg PO q4-6h PRN. Side effects are similar to other opioids.

Pain the 5th Vital Sign

- **Codeine** is a prodrug with analgesic and antitussive properties. It undergoes hepatic metabolism by CYP2D6 to morphine and is eliminated via urine. Its onset of action occurs in 10 to 30 minutes and lasts for 4 to 6 hours. The typical dose is 15 to 60 mg PO. Its effect is more unpredictable due to varying rates of metabolism among the population. It is therefore contraindicated in poor or ultrarapid metabolizers as there may be a lack of efficacy or hepatic toxicity, respectively.
- **Tramadol** is a prodrug that works as a μ -receptor agonist and a serotonin-norepinephrine reuptake inhibitor. It undergoes hepatic metabolism by CYP2D6 to an active metabolite O-desmethyltramadol (M1) and is eliminated via urine. Its onset of action occurs around 60 minutes and lasts for 2 to 3 hours. The typical dose is 50 to 100 mg q4-6h PRN. In addition to the common side effects of opioids, it may also cause hallucinations, seizures, and swelling of the tongue, eyes, and throat.
- **Meperidine** is a synthetic μ -opioid. It undergoes hepatic metabolism to its active neurotoxic metabolite, normeperidine, and is eliminated via urine. Effect is seen within 3 to 6 minutes and lasts for 2 to 4 hours. The typical dose is 50 to 150 mg PO, IM, or subcutaneously. It should not exceed 600 mg/day and should not be given for more than 48 hours. Accumulation of normeperidine can cause tremulousness, myoclonus, seizures, syncope, and hallucinations. Meperidine is therefore contraindicated in patients with seizures as normeperidine can decrease seizure threshold, and in those on MAOIs as it can cause muscle rigidity, hyperpyrexia, and seizures.

Non-opioid Analgesics

- **Nonselective NSAIDs** have anti-inflammatory, analgesic, and antipyretic effects and have a lower risk of PONV and sedation. Examples include ketorolac, ibuprofen, and diclofenac. NSAIDs work by inhibiting COX-1 and COX-2 enzymes, thereby inhibiting prostaglandin synthesis. They are metabolized in the liver and eliminated via urine. Half-lives vary and can be classified into short-acting (<6 hours, such as ketorolac, ibuprofen, and diclofenac) and long-acting (>6 hours, such as naproxen). These can be administered preoperatively or postoperatively. Typical doses include 15 to 30 mg IV for ketorolac, 400 mg PO for ibuprofen, and 50 mg for diclofenac. Side effects include platelet dysfunction, GI ulceration, and nephrotoxicity.
- **COX-2 inhibitors** include **celecoxib** and **meloxicam**. Meloxicam is COX-2 selective at low doses but is less selective at doses needed to treat acute pain. These are long-acting with half-lives of 11 hours for celecoxib and 15 to 20 hours for meloxicam. Celecoxib can be given preoperatively at a dose of 400 mg PO or 100 to 200 mg postoperatively. Meloxicam is given as 30 mg IV over 15 seconds but has a delayed onset of effect. Side effects are similar to NSAIDs with decreased risk of GI ulceration and bleeding. These can cause fluid retention and hypertension, however, so should be avoided in those with CAD, CVD, or sulfa allergies.
- **Acetaminophen** is an analgesic and antipyretic with no anti-inflammatory effect. It works as a COX inhibitor centrally with minimal peripheral effects. It is hepatically metabolized and eliminated via urine. It works within 8 minutes (IV, Ofirmev) or 37 minutes (PO) and has a half-life of 2 to 2.5 hours. The typical dose is 325 to 650 mg PO or 1g IV over 15 minutes. Hepatotoxicity can occur at high doses.
- **Ketamine** is a dissociative anesthetic with hypnotic, analgesic, and amnestic effects. It mainly works as an NMDA receptor antagonist but also affects the μ -opioid, monoaminergic, and GABA receptors. It is metabolized in the liver and eliminated in the urine. It is typically administered intraoperatively as a bolus of 0.25 to 0.5 mg/kg IV (maximum of 35 mg) followed by an infusion of 0.1 to 0.5 mg/kg/hour. Adverse effects include increased sympathetic activity, hallucinations, increased salivation, nystagmus, and possible elevated ICP.
- Selective α_2 agonists include **clonidine** (partial agonist) and **dexmedetomidine** (highly selective agonist). These have analgesic, sedative, and anxiolytic effects. They work centrally to decrease release of norepinephrine. Clonidine has a half-life of 9 to 12 hours while dexmedetomidine has a half-life of 2 hours. For perioperative hemodynamic stability and to reduce postop opioid requirements, 150 to 200 μ g of clonidine can be administered preoperatively. Dexmedetomidine can be administered preoperatively at a dose of 2.5 μ g/kg or as a bolus of 0.5 to 1 μ g/kg IV over 10-20 minutes followed by an infusion of 0.2 to 0.7 μ g/kg/hr. The benefits of α_2 agonists include decreased PONV, anxiety, postoperative shivering, and opioid consumption. Side effects include sedation, hypotension, and bradycardia at higher doses.
- **Gabapentinoids** include gabapentin and pregabalin. They act at the $\alpha_2\text{-}\delta$ subunit on voltage-gated calcium channels in sensory nerves to inhibit release of excitatory neurotransmitters, thereby reducing pain transmission. When given preoperatively, gabapentinoids may decrease postoperative pain. Gabapentin is given at a dose of 300 to 600 mg PO and pregabalin at a dose of 75 to 150 mg PO. Side effects include respiratory depression, fatigue, dizziness, somnolence, and possible visual disturbances.
- **Lidocaine** is a local anesthetic that has analgesic and anti-inflammatory properties. It works mainly by prolonging inactivation of voltage-gated sodium channels. Perioperative lidocaine infusion has been noted to improve postoperative pain in patients undergoing laparoscopic abdominal surgeries. It is administered as a bolus of 1.5 to 2.0 mg/kg IV followed by an infusion of 1.5 to 2 mg/kg/hr. Benefits include decreased opioid usage in POD 1, risk of postoperative ileus, and PONV as well as a shorter length of hospital stay. Infusion toxicity can present as bradycardia, conduction block, dizziness, visual disturbances, and seizures.

Pain the 5th Vital Sign

For Opioid-Tolerant Patients

- IV magnesium is not routinely used for perioperative pain management, but studies have shown it can be used as an infusion to decrease pain scores as well as opioid usage in POD 1. It works as an NMDA receptor antagonist and calcium channel blocker to suppress neuropathic pain. It is not associated with any serious adverse effects.
- Dexamethasone is a glucocorticoid that has analgesic, anti-inflammatory, and antiemetic properties. When given preoperatively at a dose of 0.1 to 0.2 mg/kg IV in combination with a gabapentinoid, acetaminophen, and an NSAID, it effectively attenuates postoperative pain.

References

1. Miller's Anesthesia
2. Barash's Clinical Anesthesia
3. Morgan and Mikhail's Clinical Anesthesiology
4. Faust's Anesthesiology Review
5. UpToDate – Management of Acute Perioperative Pain

ASA 2020 PRESENTATIONS

Topics and Authors

| | Topic | Presenter | Authors |
|---|--|-----------------|---|
| 1 | Ranking Programs Despite The Unknowns | Nicholas Nedeff | 1. Nicholas Nedeff |
| 2 | Type A Aortic Dissection Following Aortic Valve Replacement | Angela Chang | 1. Angela Chang, MD (R) 2. Catalina Carvajal , DO (R) 3. Kalina Nedeff, MD (R) 4. Eric Amaro, MD 5. Sofia Fischer, MD |
| 3 | Anesthetic Management For Patient With A Massive Multinodular Goiter | Angela Chang | 1. Angela Chang, MD (R) 2. Brian Cheung, MD (R) 3. James Morrow, MD (R) 4. David Riesco, MD 5. Nicholas Nedeff, MD |
| 4 | Anesthetic Management For Bovine Aortic Arch Variant In Patient With Large Type A Aortic Dissection | Jessica Reyes | 1. Jessica Reyes, MD (R) 2. Brian Chueng, MD (R) 3. Rohin Sarkar, MD |
| 5 | Large Posterior Mediastinal Teratoma Excision | Kalina Nedeff | 1. Kalina Nedeff, MD (R) 2. Katherine Medrano, MD (R) 3. Javier Kaplan, MD |
| 6 | Unsuspected Hemorrhage In "Healthy" Parturient | Kalina Nedeff | 1. Kalina Nedeff, MD (R) 2. Matthew Schepel, MD (R) 3. Jorge Sanchez-Medio, MD |
| 7 | Excision Of Chest Squamous Cell Carcinoma And Wedge Resection With Chest Wall Reconstruction And Flap Creation | Kalina Nedeff | 1. Kalina Nedeff, MD (R) 2. Sharlene Lobo, MD (R) 3. Angela Chang, MD (R) 4. Sofia Fischer, MD |

| | | | |
|----|--|--------------------|---|
| 8 | Amniotic Fluid Embolism During Repeat C-Section | Kalina Nedeff | <ol style="list-style-type: none"> 1. Kalina Nedeff, MD (R) 2. Katherine Medrano, MD (R) 3. Parneet Parekh, DO (R) 4. Jorge Sanchez-Medio, MD |
| 9 | Anesthetic Implications In A Patient With Cervical Spine Hardware Penetrating The Foramen Magnum | Samridhi Laroia | <ol style="list-style-type: none"> 1. Samridhi Laroia, MD (R) 2. Catalina Carvajal, DO (R) 3. Austin Smith, DO (R) 4. Sofia Fischer, MD |
| 10 | Lessons Learned as an Ambulatory Surgical Center Director: How to Thrive, Not Just Survive | Leopoldo Rodriguez | <ol style="list-style-type: none"> 1. Leopoldo Rodriguez, MD |

ASA 2020 RESIDENT DELEGATES

Congratulations to our FSA ASA resident delegates:
Kalina Nedeff and Brian Cheung.

