An adolescent with chronic abdominal pain, GI dysmotility, colitis s/p colectomy now with worsening pain….searching for the perfect analgesic.

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Objectives:

1. Describe the brain-gut axis and discuss the effects of commonly used analgesics on bowel function.
2. Discuss the role of adjuvant analgesics and regional analgesia in abdominal pain.
3. Discuss opioid tolerance and dependence vs. addiction in the pediatric patient.

Case History:
A 11 yo male with chronic abdominal pain, poorly defined gastric motility disorder s/p gastric pacemaker, feeding intolerance on TPN, colitis s/p colectomy and ileostomy. Patient presents with intractable pain at the site of his gastric pacemaker and requests removal of the pacemaker. Patient has had no improvement in PO intake and requires TPN and NG feeds for the majority of his nutrition. The patient describes the pain as constant, sharp and burning, like a hot poker being shoved into his stomach. He also has intermittent episodes of cramping abdominal pain that is worsened by eating. The pain has been progressively getting worse over the past six years. He has associated systems of nausea, vomiting, and bloating.

Questions:
What is the difference between visceral and somatic pain? What is visceral hypersensitivity? Somatic hypersensivity? What is the enteric nervous system? How would you classify the patient's pain?

Case History:
The inpatient acute pain service in consulted to help with pain management. His outpatient medications include sucralfate, lansoprazole, fentanyl duragesic patch, oral hydromorphone, nortriptyline, sertraline, clonidine, ondansetron. Overnight a hydromorphone PCA was initiated.

Questions:
What are the effects of opioids on the enteric nervous system? What is the role of opioids in treating abdominal pain? Is there a role for antidepressants and alpha agonists (clonidine) or other adjuvants?

Case History:
During morning rounds the patient is seen resting in bed with his mother at bedside. On exam he a thin male, well groomed, articulate and in no apparent distress. His abdomen is soft, non-distended with multiple well-healed incisions and a healthy ileostomy site. Vitals signs are normal. Labs reveal anemia but are otherwise normal. He states that his pain is 10/10 and located at the site of the gastric pacemaker.

Questions:
What additional pharmacologic agents could be utilized? There is concern that he is not absorbing medications from his gut. What agents can be used in a patient with poor absorption?

Case History:
Recommendation for lidocaine patches and gabapentin is made. Mom reports that the he has tried these medications in the past and they haven't helped but she is willing to try them again. Mom reports that the patient is having a hard time dealing with the pain. He has not been able to go to school and he has been interacting as usual (fighting) with his brother.

Questions:
What role does stress and anxiety have in abdominal pain. Describe the brain-gut axis and how this may contribute to abdominal pain. What non-pharmacologic interventions can we utilize?

Case History:
Psychiatry is consulted and the patient's Zoloft is increased to help with the symptoms of depression. Self hypnosis is introduced to the patient several times per week. Massage therapy and recreation therapy are consulted. The patient reports little relief with these interventions. Mom states that epidural anesthesia in the past has worked for surgery and asks if there is anything else we can do?

Questions:
What role does regional anesthesia play? What options do we have for regional anesthesia?

Case History:
We place bilateral TAP blocks with some relief in pain. He reports his pain score in now an 8/10. However, the relief is short lived and the patient is using escalating doses of opioids. Surgery decides to take the patient to surgery to remove the gastric pacemaker.

Questions:

What are some options to manage postoperative pain in the patient with chronic pain? What role do NMDA receptor antagonists play? What about regional anesthesia?

Case History:
An epidural catheter is placed and intraoperative ketamine is utilized to help with postoperative pain. During induction of anesthesia the patient states that the drugs feel so good. He says that when he has surgery is the only time he feels good. Postoperatively the patient is using more opioids and calls the on-call team for additional boluses of opioid medications. The team is concerned that the patient is displaying addictive behaviors.

Questions:
How do you differentiate between opioid tolerance and dependence vs. addiction? Are there other secondary gains? Does playing the sick role benefit the patient or parent? The mother spends all of her time with her sick child. The patient has been missing school. What options are there for treatment of opioid addiction in pediatrics?

Case History:
We started de-escalating opioid therapy and referred the patient for an inpatient intensive pain rehabilitation program. Opioids are likely making this patient's pain worse due to worsening the motility of the gut. After extensive discussions with the family and his care providers, weaning opioids was determined as the best further course of treatment.

References:

1. Batra A, Bevan A, Beattie RM. Pain and gastroenterological diseases. In: McGrath et al, ed. *Oxford Textbook of Paediatric Pain.* 1st ed. Oxford, United Kingdom: Oxford University Press;2014:257-68.
2. Schurman JV, Deacy AD, Friesen CA. Recurrent abdominal pain in children and adolescents. In: McGrath et al, ed. *Oxford Textbook of Paediatric Pain.* 1st ed. Oxford, United Kingdom: Oxford University Press;2014:289-97.
3. Weydert JA, Ball TM, Davis MF. Systematic review of treatments for recurrent abdominal pain. *J Pediatr* 2003;111(1):e1-e11.
4. Hojsted J, Sjogren P. Addiction to opioids in chronic pain patients: A literature review. *Eur J Pain* 2007;11:490-518.
5. Scharff L. Recurrent abdominal pain in children: A review of psychological factors and treatment. *Clin Psychol Rev* 1997;17(2):145-66.
6. Hyams JS, Hyman PE. Recurrent abdominal pain and the biopsychosocial model of medical practice. *J Pediatr* 1998;133:473-8.
7. Holzer P. Opioid receptors in the gastrointestinal tract. *Regul Pept*. 2009;155:11-7.
8. DiLorenzo C, Youssef NN, Sigurdsson L, Scharff L, Friffiths J, Wald A. Visceral hyperalgesia in children with functional abdominal pain. *J Pediatr* 2001;139:838-43.

9. Wood JD, Alpers DH, Andrews PLR. Fundamentals of neurogastroenterology. *Gut* 1999:45(Suppl II);II6-II16.
10. Bhatia V, Tandon RK. Stress and the gastrointestinal tract. *J Gastroenterol Hepatol* 2005;20:332-9.
11. Gundy D, Al-Chaer ED, Aziz Q et al. Fundamentals of neurogastroenterology: Basic science. *Gastroenterology* 2006;130:1391-1411.
12. Simpson DM, Tyrrell J, De Ruiter J, Campbell FA. Use of ultrasound-guided subcostal transversus abdominis plane blocks in a pediatric patient with chronic abdominal wall pain. *Pediatr Anesth* 2011;21:88-90.
13. Nizamuddin SL, Koury KM, Lau ME, Watt LD, Gulur P. Use of targeted transversus abdominus plane blocks in pediatric patients with anterior cutaneous nerve entrapment syndrome. *Pain Physician* 2014;17:E623-7.
14. Faure C, Wieckowska A. Somatic referral of visceral sensations and rectal sensory threshold for pain in children with functional gastrointestinal disorders. *J Pediatr* 2007:150;66-71.