Background
Phaeochromocytoma have multiple symptoms including, nausea, tachycardia, paroxysmal hypertension, sweating, and headache (1). Migraine has some of the manifestations seen with phaeochromocytoma. We describe a patient who had a history of migraine headaches since childhood and was found to have phaeochromocytoma and subsequently Multiple Endocrine Neoplasia.

Clinical Case
A 20-year-old female, with a history of migraine since childhood, presented to hospital with headache, abdominal pain, nausea and vomiting. She has been on topiramate, cyclophosphamide, fioricet, oxycodone, and sumatriptan for migraine headaches for the previous six years. Her blood pressure was 130/80, heart rate 112 BPM. Physical exam was unremarkable except for a slightly tender abdomen. CT scan of abdomen revealed a heterogeneous 6.0 cm right adrenal mass (Picture 1). Work up for the adrenal mass showed a 24-hour urine free cortisol of 78 mcg/24 hr (normal (nl) <50), metanephrine 1,195 mcg/24 hr (nl 24-290), normetanephrine 6,680 mcg/24 hr (nl 82-500), dopamine 244 mcg/24 hr (nl 65-400), epinephrine 50 mcg/24 hr (nl 0-20), and normetanephrine 815 mcg/24 hr (nl 0-135) with creatinine level indicating adequate collection. Serum aldosterone and renin were normal. Phaeochromocytoma was diagnosed and she was started phenoxybenzamine followed by metoprolol. She underwent right adrenalectomy one week later.

Pathology was consistent with phaeochromocytoma (Picture 2). After subsequent follow up, her migraine attacks become less frequent and she stopped three of her pain medications. Serum calcitonin level checked in follow up visit was 30.1 pg/ml (nl <15). Genetic testing came back positive for RET germline mutation involving codon 634. She underwent thyroidectomy and was found to have medullary thyroid cancer.

Discussion
The patient has headache since childhood, and for seven years, she has been on five pain medications. Migraine affects only 2-7 % of children (2). Headache occurs in up to 90% of phaeochromocytoma cases (1). Tumor resection has drastically improved her headache. The incidence of these tumors is 0.8 case in 100,000 person-years (3). Most of them are sporadic and approximately 10% are familial (4). In familial cases, the disease is inherited as autosomal dominant (5). This patient has no previous family history of phaeochromocytoma. However, the chronicity of headache suggests that her phaeochromocytoma has been present since childhood (6). Would this patient have been diagnosed earlier with phaeochromocytoma, her MTC may have been avoided with prophylactic thyroidectomy.

Discussion (continued)
An earlier work-up for this tumor was probably warranted based on her symptoms. After diagnosing phaeochromocytoma, she was found to carry a germline mutation at codon 634 of the RET proto-oncogene. This mutation is associated with Multiple Endocrine Neoplasia type 2A (MEN-2A). Her calcium and parathyroid hormone were in the normal range although her calcitonin level was elevated. Thyroidectomy revealed the presence of medullary thyroid cancer (MTC). American Thyroid Association recommends thyroidectomy before the age of five for patients known to be carrier of this mutation (6). Would this patient have been diagnosed earlier with phaeochromocytoma, her MTC may have been avoided with prophylactic thyroidectomy.

Conclusion
1) Headache is a highly prevalent symptom of phaeochromocytoma.
2) Children and adolescents requiring multiple medications for headaches may need to be screened for phaeochromocytoma.
3) Treating phaeochromocytoma have significant impact on headaches symptoms.
4) Diagnosing phaeochromocytoma triggers further work up that may rule in other associated conditions like MEN and MTC.

References: