ABDOMINAL PAIN - RULE OUT APPENDICITIS

Observation Unit Transfer Criteria

Abdominal pain - periumbilical, RLQ
Stable VS
Ancillary Signs/Sx - anorexia, N&V, fever, elevated WBC (any pt. may have some or all)
MANTRELS score less than 6

Exclusion Criteria

Previous appendectomy
Unstable VS
Immunocompromised patient
Pregnant pt., ectopic pregnancy
Bowel obstruction
Surgical abdomen - free air, rigidity, rebound tenderness, new mass

Observation Unit Interventions

NPO, IV hydration, repeat CBC, radiology/ultrasound studies (prn)
Serial VS, serial exams, MANTRELS Score* q-2-h
Surgical consultation as needed
Pain medication prn

Disposition

Home:
- Pain resolved or significantly improved
- VS stable
- *MANTRELS Score remains same or decreasing
- Work-up negative

Admit:
- Persistent vomiting,
- Pain not resolving/worsening
- Develops surgical abdomen
- Unstable VS
- *MANTRELS Score rising
- Positive finding on work-up that requires further treatment or investigation

*** MANTRELS Score:**

(Trend over time more valuable than any single score.)

Number of Points for each:	**SCORE:**
Migration (**1**) **A**norexia-**A**cetone (**1**) **N**&V (**1**) RLQ **T**enderness (**2**) **R**ebound (**1**) **= EXCLUSION FROM OBS.** **E**levation of temp (**1**) **L**eukocytosis (**2**) **S**hift to left (**1**)	5-6 consider appendicitis, 7-8 appendicitis likely, 9-10 appendicitis probable.

The MANTRELS Score was first proposed by Dr. Alfredo Alvarado in an Annals article in 1986. Looking retrospectively at patients with abdominal pain who were ultimately diagnosed with or without appendicitis he was able to develop a score based on 8 findings. These findings were as follows:

- **M**igration of pain - usually begins periumbilical, migrates to RLQ
- **A**norexia - **A**cetone - pts. with appendicitis will typically have no appetite and may show ketones in the urine
- **N**&V - often seen, relatively sensitive, not specific
- **T**enderness - most typical in RLQ over McBurney's point
- **R**ebound - indicative of peritoneal irritation common to appendicitis
- **El**evation of temperature - low grade fever is typical
- **L**eukocytosis - WBC > 10,000 tended to be sensitive with a good positive predictive value but very non-specific
- **S**hift to Left - like leukocytosis it is seen but is not very specific

In two abstracts published in the Annals by Louis Graff the Alvarado scoring system for appendicitis was found to be most predictive in those groups of patients who had a higher prevalence of appendicitis. In a group with a relatively low incidence of appendicitis, say 8%, a MANTRELS Score of 5 is modestly predictive of appendicitis. However, in a group of patients in whom the prevalence of appendicitis is high, say 20%, then the same MANTRELS Score of 5 predicts appendicitis with great accuracy. Graff developed a nomogram based on disease prevalence and MANTRELS Score. The problem is determining what prevalence group any single patient belongs to at the time you are examining that patient. In an additional study by Graff he found that over time those patients with appendicitis most typically had a rising MANTRELS Score. Those patients found not to have appendicitis most often had a falling score. It is felt that a single score for a patient has far less predictive use as opposed to a trend. A rising score tends to be associated with appendicitis regardless of the prevalence group a patient may belong to and would likely be the most valuable contribution this scoring system could add to the evaluation of appendicitis in the Observation Unit.

References:

Alvarado A. A practical score for the early diagnosis of acute appendicitis. *Ann Emerg Med.* 1986;15:557-564.
Graff LG, Radford MJ. Probability of appendicitis nomogram. *Ann Emerg Med.* 1990;19:607-608.
Graff LG, Radford MJ. Abdominal pain: Threshold to observe affects emergency physician diagnostic performance. *Ann Emerg Med.* 1990;19:486-487.