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To: VCU Health Physicians, Housestaff and Nurses

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Susan D. Roseff, M.D. SDR
Chair, Division of Clinical Pathology

Date: October 28th, 2022

Re: **Urine Opiate Result Reporting change**

Dear Colleagues,

Effective Monday, October 31st, 2022, the VCUHS clinical laboratory will report quantitative results for urine opiate confirmation testing to align with practice guidelines for assessment of potential variant drug metabolism, detection of pharmaceutical impurities, and in cases of opioid polypharmacy (1).

The test "Opiate ID Confirmation, Urine" will report values between 50- 10,000 ng/mL for morphine, codeine, hydromorphone, hydrocodone, oxycodone and oxymorphone. Values from 10- 1,000 ng/mL will be reported for 6-acetylmorphine, a unique metabolite of heroin.

Results will be reported with comments to aid in interpretation. Comments that will accompany all results are listed below:

- The detection interval for opiates is generally 2 to 3 days after last ingestion.
- The absence of expected drug(s) and/or drug metabolite(s) may indicate non-compliance, inappropriate timing of specimen collection relative to drug administration, poor drug absorption, diluted/adulterated urine, or limitations of testing.
- Trace amounts of codeine, morphine, hydrocodone and/or hydromorphone may be present as pharmaceutical impurities in oxycodone preparations and can be detected in in patient samples with high concentrations of oxycodone.

Comments that will accompany specific positive results are listed below:

1. **Codeine:** Codeine is metabolized to morphine with a half-life of 2 to 4 hours. If codeine is ingested, the ratio of codeine to morphine generally exceeds 1.0 in urine during the first 24 hours from ingestion. The ratio may fall below 1.0 after 24 hours, and after 30 hours, only morphine may be detected.

2. **Morphine:** The presence of morphine in urine can indicate exposure to morphine, heroin, or codeine within 2 to 3 days of ingestion. Ingestion of bakery products containing poppy seeds can also cause morphine to be excreted in urine at low concentrations.
3. **Hydrocodone:** Hydrocodone is metabolized to hydromorphone.
4. **Hydromorphone:** Hydrocodone may be detected individually or as a metabolite of hydrocodone and/or morphine; therefore, the presence of hydromorphone could also indicate exposure to hydrocodone or morphine.
5. **Oxycodone**: Oxycodone is metabolized to oxymorphone and is excreted primarily via the kidney.
6. **Oxymorphone**: Oxymorphone may be present individually or as a metabolite of oxycodone, therefore, the presence of oxymorphone could also indicate exposure to oxycodone.
7. **6-Acetylmorphine (6-MAM)**: 6-MAM is a unique metabolite of heroin, and its presence is a definitive indication of recent heroin use. Like heroin, 6-MAM has a very short half-life and detection window. Heroin is metabolized to 6-MAM then to morphine, the dominant metabolite of heroin.

(1) Jannetto PJ et al. Executive Summary: American Association of Clinical Chemistry Laboratory Medicine Practice Guideline—Using Clinical Laboratory Tests to Monitor Drug Therapy in Pain Management Patients. J Applied Lab Med, 2018.

Please contact Grace Williams at grace.r.williams@vcuhealth.org with any questions or concerns.