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The “White Powder Sign” for Substance Use in Hospitalized Patients

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TO THE EDITOR:

Hospitalizations for patients with substance use disorder are common^{1,2} and pose unique challenges given that substance use can persist while patients are hospitalized.^{3,4} Objective evidence is helpful in evaluating for in-hospital substance use as it limits possible bias in clinicians’ interpretations of patient behavior. Here, we present a case in which the discovery of an objective indicator, previously undocumented in the literature, provided conclusive evidence of nonmedical use of dispensed medications.

Ms. M, a 34-year-old woman with a history of opioid use disorder, attention deficit hyperactivity disorder (ADHD), and multiple hospitalizations for systemic infection related to injection drug use, was admitted for management of bilateral hip infections. Her home medications, including buprenorphine/naloxone and methylphenidate, were continued during the hospitalization. Her primary medical team became concerned about possible nonmedical use of medications as she exhibited several unusual behaviors. On one occasion, she was seen apparently attempting to obtain injection supplies from the crash cart. On another, she showed her nurse white pill halves that she said were from previous oral methylphenidate administrations; she told her nurse that she had found them on the floor and requested a replacement dose. Urine drug screens were consistently negative for non-dispensed substances, and room and visitor searches yielded no abnormal findings.

Nevertheless, on several occasions, clinical staff noted the presence of “crystals” or “white powder” in her intravenous (IV) tubing. A nurse noted that the powder had not been there when she last used the IV but was present later in the day, after administration of Ms. M’s

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oral medications. Moreover, none of the medications that Ms. M had received through the IV (daptomycin, micafungin, and ondansetron) were known to form a precipitate during IV administration. Therefore, although the powder was not sent for analysis, this “white powder sign” was interpreted as objective evidence of Ms. M’s use of her IV to inject crushed medications. She denied such use. For safety, the team implemented a protocol for direct observation to ensure proper ingestion of all oral medications.

Ms. M continued to receive IV antibiotics, but her course was complicated by a cecal bascule that required an exploratory laparotomy and bowel resection. Buprenorphine/naloxone was held perioperatively. Our addiction psychiatry service was consulted for assistance with pain management in the context of her opioid use disorder and suspected ongoing nonmedical medication use. Our service recommended maintaining close monitoring and treating her with IV hydromorphone, which was then transitioned to oral hydromorphone. Buprenorphine/naloxone was eventually restarted, but she continued to require intermittent hydromorphone for breakthrough pain. After four total weeks of hospitalization, Ms. M stated that she preferred to be discharged from the hospital; she was switched to an oral antibiotic regimen and discharged home with scheduled outpatient follow-up.

In our patient what we have named the “white powder sign,” caused by the backflow of the crushed medication remaining in the IV or saline lock without adequate flushing, served as an objective indicator of nonmedical use of dispensed medications when urine drug screens and room searches were not useful. At our hospital, the “white powder sign” is one component of a codified hospital misuse checklist.⁵ Tools like the hospital misuse checklist, which primarily includes objective indicators, can help avoid reliance on individual clinicians’ subjective interpretation of patient behavior. Previous studies have identified limitations of such interpretation as clinicians may underestimate patients’ pain or assume they are “drug-seeking.”⁶ Other objective indicators listed in the hospital misuse checklist that were observed in Ms. M included “cheeking” or hoarding medications and attempting to obtain injection supplies from the room.

Notably, the hospital misuse checklist is not intended to “catch” patients acting aberrantly to justify discharging them or withholding pain medications. Instead, clinicians should view in-hospital substance use as a manifestation of the patient’s underlying substance use disorder, which may be exacerbated by hospitalization-based stressors, such as loss of autonomy, boredom, pain, and an uncertain prognosis and yet it is often undertreated in hospitals.⁷ As such, the clinician’s role is to manage the substance use disorder as well as possible potential harms of in-hospital substance use and to minimize them, with the ultimate goal of helping patients remain safely in the hospital to receive medically necessary care. In this case, such an approach enabled Ms. M’s team to keep her engaged in treatment for a potentially life-threatening systemic infection for four weeks. From this perspective, we believe this case represents a relative success for Ms. M and the team caring for her.

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