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NEWS

RSNA Press Release

CT Best at Uncovering Drug Mule Payload

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At A Glance

- CT is the most accurate method of detecting cocaine inside the body of a drug mule.
- Cocaine containers can be as large as a banana or as small as a blueberry.
- Low-dose CT protocols need to be implemented for future routine imaging of suspected drug mules.
- X-rays identified the presence of cocaine containers 70% of the time.

CHICAGO — According to a study presented today at the annual meeting of the Radiological Society of North America (RSNA), the best way to detect cocaine in the body of a human drug courier, known as a mule, is through computed tomography (CT).

"Cocaine from South America is making its way to Europe through Africa," said Patricia Flach, M.D., a radiologist at University Hospital of Berne and Institute of Forensic Medicine of Berne in Switzerland. "From Africa, drug mules most commonly try to enter the European Union and Switzerland."

When legal authorities suspect an individual of being a drug mule, they often turn to radiologists to help quickly detect the presence of cocaine concealed in the body. Cocaine containers, which may be swallowed or inserted in the vagina or rectum, can be as large as a banana or as small as a blueberry.

"In these cases it is important for us to know that we have identified all the drug containers in a body, both for legal purposes and for the health of the patient," Dr. Flach said. "However, there was no research telling us which imaging modality was best in detecting cocaine containers in the stomach, intestines or other body orifices."

Dr. Flach and colleagues analyzed images from 89 exams performed on 50 suspected drug mules over a three-year period at University Hospital. The study group included 45 men and five women between the ages of 16 and 45. Forty-three of the suspects were ultimately identified as drug mules.

Of the imaging exams conducted, 27 were CT, 50 were digital x-ray and 12 were low-dose linear slit digital radiography (LSDR), an extremely fast, high-resolution, full-body x-ray system primarily used for trauma patients. The radiologic findings were compared with a

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written record of the drug containers recovered from the feces of suspects.

"As we expected, CT imaging allowed us to see all the drug containers, especially when we knew what to look for," Dr. Flach said.

The results showed that the coating and manufacture of the containers changed their appearance, especially on CT images. Rubber coated condoms filled with cocaine appeared very hyper-dense, or white, on CT, while other containers of similar size with plastic foil wrapping appeared iso- to hypo-dense, or gray to black. This contradicts some previous reports that have suggested image density may correlate with the drug content.

The sensitivity of CT was 100 percent, meaning CT was able to find all cocaine containers that were present in the drug mules' bodies. LSDR had a sensitivity rate of 85 percent, and digital x-ray was able to identify the presence of cocaine containers only 70 percent of the time.

"There were positive findings on CT that were clearly not detectable on x-rays due to overlap of intestinal air, feces or other dense structures," Dr. Flach said.

While CT was clearly the most accurate imaging modality in detecting the drug containers, the increased ionizing radiation associated with the exam is a concern when imaging people who are presumably healthy.

"CT is the way to go," Dr. Flach said. "But low-dose protocols need to be implemented to ensure the safety of the people undergoing the procedure."

Coauthors are Steffen Ross, M.D., Gary Hatch, M.D., Ulrich Preiss, M.D., Thomas Ruder, M.D., Michael Thali, M.D., and Michael Patak, M.D.

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