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Purple Urine Bag Syndrome

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A 67-year-old woman presented to the emergency department in congestive heart failure. She also had a history of transverse myelitis, which had caused her to be bedbound with an indwelling urinary catheter. During the physical examination, the urine in her Foley tubing and bag were noted to be bright purple. When asked, she replied that the urine had turned purple several weeks earlier. She denied suprapubic pain, but did complain of terrible constipation. Her urinalysis was significant only for a pH of 9, many bacteria, and 4 RBC/hpf. Her urine culture later grew >100,000 organisms/mL *Morganella morganii* and >100,000 organisms/mL *Proteus mirabilis*.

Purple Urine Bag Syndrome (PUBS) is an uncommon syndrome that occurs predominately in constipated bedbound women with chronic indwelling Foley catheters in which both the urine and catheter set become purple.¹ The cause of this color change is still not completely known, but is thought to arise from a complex series of chemical interactions resulting

from concurrent constipation and urinary tract infection (UTI).^{2,3}

Constipation allows adequate time for gut flora to deaminate dietary tryptophan to indole. Indole then travels via the portal system to the liver, where it is conjugated to indoxyl sulfate. This is subsequently excreted into the urine, where bacterial indoxyl sulfatases catalyze it to indoxyl. This metabolite then oxidizes to both indigo (blue) and indirubin (red) in the presence of a high urinary pH.^{1,2} These pigments interact with the plastic of the catheter set to create a purple hue.⁴

Common causative bacteria are *Proteus mirabilis*, *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*, *Escherichia coli*, *Morganella*, and *Enterobacter* spp.^{1,4} While overall a benign condition, PUBS should signal to the clinician the presence of an underlying UTI that should be treated to prevent serious complications.^{1,5} This includes antibiotic administration and improving Foley catheter care and hygiene.^{1,2}



Figure. Purple urine and catheter set.

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