Urinary System, Urolithiasis Case Study. Peter, a forty-three year old office worker, was struck with a very sudden and intense pain in his side and lower back. He was breathing deeply, and the pain began to recede. Eight minutes later, the pain was not as severe but Peter was still uncomfortable and called his physician. One of Peters’s colleagues drove Peter to the doctor’s office. While on the way to his appointment, Peter experienced another bout of severe pain and began to feel nauseous. The pain seemed to be spreading into his lower abdomen and groin. After asking Peter a few questions about his symptoms, the doctor requested an abdominal x-ray, several blood tests, and urinalysis. As Peter supplied the urine sample he was disturbed to notice that the urine had a pinkish cast. The physician returned and informed Peter that he had a kidney stone which, based on its size, should pass on its own within a day or so. The doctor told Peter that he should rest at home until the stone passed, drink at least 2-3 quarts of water each day, and strain his urine in order to retrieve the stone for analysis. The doctor also gave Peter a prescription for pain medication. Peter passed the stone the following morning and brought it to the doctor’s office. Analysis of the stone’s composition revealed that it was a calcium stone. Peter’s blood and urine tests had also shown high calcium levels. Based on this, the doctor told Peter to eat fewer foods containing calcium or oxalate and provided Peter with a list of foods to limit. He also told Peter to continue to drink at least two quarts of water each day. Respond to the following questions and statements using the case study below 1. List the components of the urinary tract from the renal pelvis outward. 2. Why would water facilitate the passage of kidney stones? 3. Why would water aid in the prevention of developing future kidney stones? 4. List the three stages in the formation of urine and describe each stage with regard to the structures involved and the direction substance transport. 5. The glomerular filtrate concentration of calcium (Ca+2) is about 4 mEq/L. The concentration of calcium in the urine is about 5 mEq/L. How would you explain this difference?