



Opioid analgesics have
the potential to affect
every major body system.

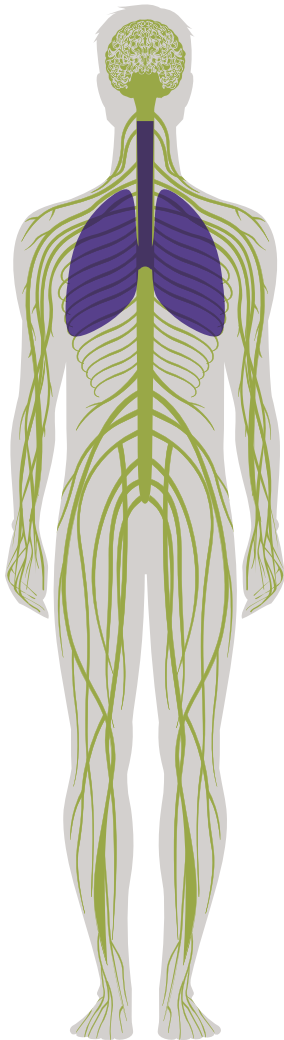
Meet Tom.

This is Tom.

The side effects of opioid analgesics often outweigh the benefits of their pain-relieving properties. To illustrate these effects, we share the story of Tom, a 49-year-old man who injured his back when he tripped while unloading his truck. He lost his balance, fell and twisted his lower back, causing immediate right-sided, low-back pain. Initially, the pain only affected the lower spine and his symptoms were effectively treated with nonsteroidal anti-inflammatories (NSAIDs). A few weeks later, however, his low back pain started traveling down the back of his upper thigh, through his calf muscles and into the bottom of his right foot. He developed right leg weakness that, in combination with the pain, decreased his balance and made walking difficult.

Tom participated in physical therapy, water therapy and tried epidural steroid injections. With his pain worsening and unresponsive to all other treatment measures, his physician recommended a lumbar fusion. Despite surgery, his pain persisted. Tom ultimately underwent a second lumbar fusion. A diagnosis of failed back syndrome followed and a spinal cord stimulator was implanted but was later removed due to its limited effectiveness. Thus, his pain medications, mostly short and long-acting opioid analgesics, had become the sole treatment for his uncontrolled pain. Even with monitoring to ensure proper usage of his opioid analgesic medications with a signed medication agreement (pain contract), regular pill counts and urine drug testing, Tom still experienced side effects that would eventually impact nearly all of his major body systems.





RESPIRATORY SYSTEM

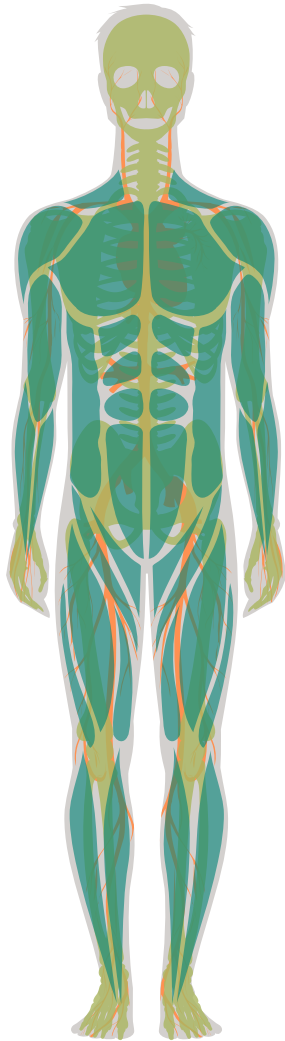
Due to the high dosage of opioid analgesics Tom was taking, he was at a high risk of overdose and respiratory depression. Opioids decrease the brain's ability to sense high levels of carbon dioxide in the blood and diminish the amount of air breathed in by the lungs. This is the most common way that people die from an opioid analgesic overdose — their breathing slows down, their breathing stops and they ultimately suffocate.



NERVOUS SYSTEM

The central nervous system, made up of the brain and spinal cord, is particularly vulnerable to the effects of opioid analgesics. For instance, opioid analgesics have been found to increase the likelihood of either developing depression or further worsening preexisting depression. Depression is often accompanied by social isolation and sleep disturbances, either insomnia or excessive daytime sleepiness. Furthermore, opioid analgesics have the potential to over-sensitize the brain, leading to a condition called opioid-induced hyperalgesia, wherein patients actually experience increased amounts of pain.

Tom lived alone and had ongoing battles with depression. His doctor was concerned that his depression was contributing to his perception and intolerance of pain and encouraged him to receive counseling. Tom was also prescribed an anti-anxiety medication, but he could not tolerate it and never sought additional treatment for his depression. He also had difficulty sleeping and received medication for insomnia.



SKELETAL SYSTEM

Under normal circumstances, the body's skeletal system is in an almost constant state of turnover; older bone tissue is broken down and new, stronger bone tissue is formed. Opioid analgesics have been found not only to impair this process by having a direct effect on bone-generating cells, called osteoblasts, but also negatively affect the hormones of the body regulating bone growth. While he did not sustain any fractures, Tom did fall several times because of decreased balance and right leg weakness, as well as the sedating effects of his opioid analgesic medications. Use of opioid analgesics also placed him at a much higher risk for bone injury.



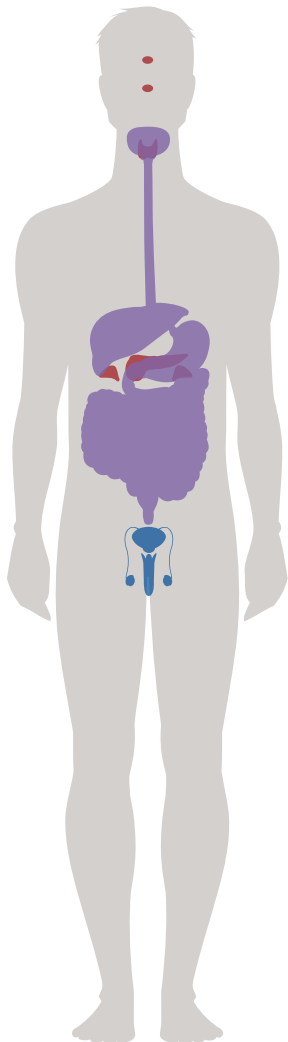
MUSCULAR SYSTEM

Tom had developed disabling depression and excessive fatigue from the opioid analgesics he was taking, to the point that he was no longer an active man. Whereas he had once enjoyed playing intramural basketball twice a week, he now spent most of his days lying in his bed, struggling to find a comfortable position. Over time, his muscles became weak and his overall endurance declined. Beyond the resultant inactivity, opioid analgesics also affect the body's hormones and can further negatively affect muscle mass and strength.



CARDIOVASCULAR SYSTEM

Tom had high blood pressure, a risk factor for heart disease. His blood pressure control became so erratic that Tom's pain management physician recommended a visit to the walk-in clinic for treatment. Some opioid analgesics, including morphine and meperidine, have been associated with a small increased risk of myocardial infarction or heart attack. The risk of heart attack has also been found to be increased in patients like Tom, who take multiple opioid analgesics at one time.



ENDOCRINE SYSTEM

Tom felt emotionally and physically drained. This was perceived as a sign of weakness and defeat, but was actually a symptom of an under-recognized condition called opioid-induced androgen deficiency (OPIAD). Testosterone is the predominant male sex hormone and helps promote physical energy and muscle strength. With OPIAD, decreased testosterone levels can result in depressed mood, fatigue and negative effects on other body systems, including the reproductive system.



REPRODUCTIVE SYSTEM

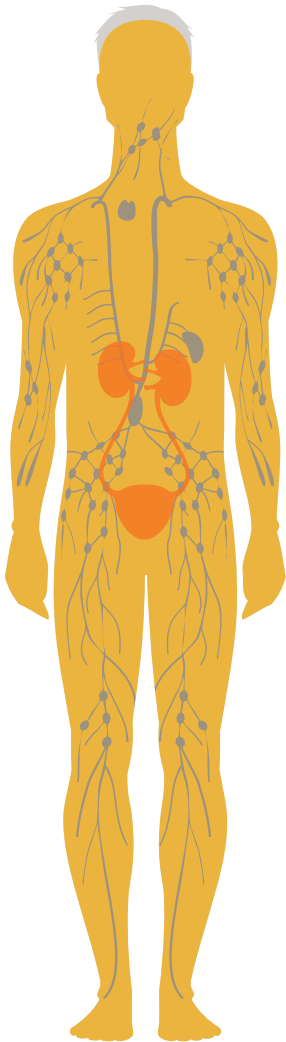
Due to the effects that opioid analgesics can have on the endocrine system and the body's hormones, both men and women are at increased risk for reproductive system abnormalities, such as decreased libido and fertility problems. Research has shown that men who use high doses of opioid analgesics for prolonged periods are about 50% more likely to require a medication for the treatment of erectile dysfunction.¹ This was the case with Tom.



DIGESTIVE SYSTEM

Some of the most commonly known side effects of opioid analgesics relate to the digestive system. Opioid analgesics increase the amount of time it takes for food to pass through the stomach, leaving a feeling of fullness long after meals. This type of medication can also have a direct effect on the vomiting center of the brain and decrease the intestinal forces required to move digested food through the bowels. Medical records indicated Tom often felt nauseous. He also experienced significant difficulties with chronic opioid-induced constipation.

1. Deyo RA, Smith DH, Johnson ES, Tillotson CJ, Donovan M, Yang X, Petrik A, Morasco BJ, Dobscha SK. Prescription opioids for back pain and use of medications for erectile dysfunction. *Spine (Phila Pa 1976)*. 2013 May 15; 38(11):909-15.



URINARY SYSTEM

When Tom first noticed difficulties with emptying his bladder, he attributed his symptoms to possible enlargement of his prostate. However, it was actually a side effect of the opioid analgesics. Opioid analgesics can cause increased resistance to urine flow out of the bladder. They can also decrease the sensation of a full bladder, limiting the amount of discomfort noticed and the urge to urinate. Both situations, as well as more complicated spinal cord involvement, can result in urinary retention that, when left untreated for long periods, can contribute to urinary tract infections and kidney damage.



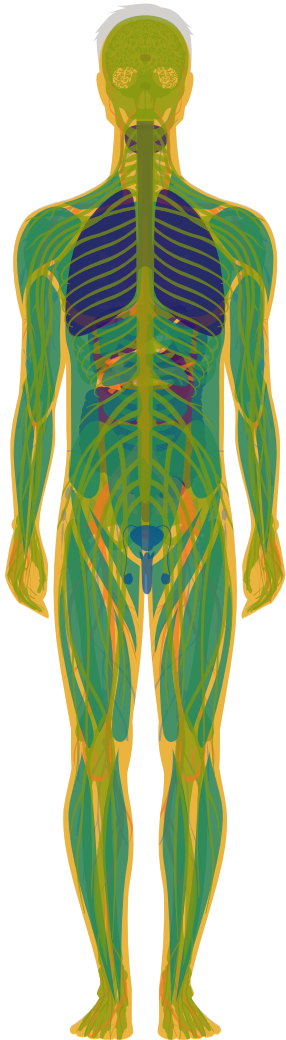
INTEGUMENTARY SYSTEM

The integumentary system, predominantly comprised of the skin, can be affected by opioid analgesics. In Tom's case, one of the first opioid analgesics he was prescribed, morphine, caused a rash and intense itching from head to toe but was worse on his chest and back. Initially his rash was treated with topical creams and later with oral antihistamines. The challenges with Tom's rash and itchy skin magnified when the medications used to manage these side effects interacted with his pain medications, leading to even greater sedation and fatigue.



IMMUNE AND LYMPHATIC SYSTEMS

Immunodepression, or a poorly functioning immune system, places people at higher risk for infection. Tom was fortunate that despite various procedures, including injections, two surgeries and the placement (and subsequent removal) of a spinal cord stimulator, long-term opioid analgesic therapy and skin irritation, he did not have any infections.



Understanding and recognizing the potential side effects of opioid analgesic medications aids in the recovery of injured workers. Teaming with a pharmacy benefit manager (PBM) could have helped proactively identify the medication complications that Tom was experiencing and reduced the impact of each condition he had, as well as reduced the risk of the side effects he had fortunately not yet experienced. As mentioned, Tom's medications were causing him to have excessive daytime sleepiness. His level of depression was disabling, likely worsened by the opioid analgesics he was taking. He experienced difficulties with nausea, constipation and sexual dysfunction — all of which likely compounded his depression and social isolation.

Through the application of our patent-pending analytic insight, veteran clinical expertise, operational flexibility and the industry's most comprehensive networks, we would not only have identified the aforementioned clinical concerns, but also would have worked with the claims professional managing the claim to take action. This undoubtedly would have yielded a better outcome — not just financially because of cost savings from the elimination of unnecessary treatment, but clinically in response to Tom receiving safer, more efficacious therapy.

Our clinical program

While opioid analgesics have an important place in medication therapy for the treatment of pain, careful consideration of the risks and benefits associated with their use must occur. The clinical tools and expertise we offer work in partnership with payer clients to promote safe and effective treatments for the compensable condition(s) associated with the claim, while remaining consistent with the business rules of the payer and any applicable regulations. By thinking of pharmacy utilization as a continuum (prospective, concurrent and retrospective), it can be easier to understand the interaction of the various inputs of our program in the effort to manage pharmacy utilization and cost.

Prospective. Data is reviewed surrounding past payer experiences, global trends in treatment, new medications being released, existing medications being used for new conditions or treatments, state of jurisdiction requirements and the types of clients served. Distilled down to formularies, drug utilization review criteria and business rules, these parameters and information help us forge the future care strategies that will guide pharmacy and payer decisions in the management of the pharmacy claim. In workers' compensation, while these may contemplate the global population of injured workers, our strategies must be sufficiently flexible to address the unique circumstances of the individual injured worker.

Concurrent. We employ utilization management technology to capture the point-of-sale transactions based on the prospectively-defined care strategies. This data fuels analytic models, allows for greater visibility into the injured worker's medication therapy regimen and lends the opportunity for clinical intervention where needed. Meanwhile, the dispensing pharmacist is alerted to relevant information about the injured worker that may assist in more appropriate dispensing of the medication, in real-time.

Retrospective. Clinicians analyze the pharmacy claim, identify intervention opportunities and reveal trends that lead us to modify and continuously improve the prospective utilization management plan to achieve better outcomes for the payer, the employer and, most importantly, the injured worker.

The greater the synchronization throughout the care continuum, the better the decisions made in the claim; better decisions lead to better outcomes.



About Optum for Workers' Compensation

The workers' comp division of Optum collaborates with our clients to deliver value beyond transactional savings while helping ensure injured workers receive safe and effective clinical care. Our innovative and comprehensive medical cost management programs include pharmacy, ancillary and managed care services from first report of injury to settlement.

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