Musculoskeletal Injures in Older Adults:
Preventing the Transition to Chronic Pain and Disability

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The increase in the number of active and independent older adults has, unfortunately, led to an epidemic of musculoskeletal injuries in this population. Chronic pain and functional decline are common sequelae from these injuries and have a major impact on quality of life. Optimizing care for these patients will likely require educating patients about analgesic risks and benefits, promoting physical activity, identifying and addressing the psychological impacts of the injury, and coordinating care between emergency physicians, orthopedists, and primary providers. Active management of acute musculoskeletal pain has the potential to prevent the transition to chronic pain and disability in this vulnerable population.

When I moved to Chapel Hill 10 years ago, my immediate neighbor was an elderly man in excellent health. He had served as a Navy pilot in World War II, then worked as a dentist. Even at the age of 87, he mowed his lawn with a push mower and took a brisk walk around the entire neighborhood every morning. He walked like a race walker in the Boston Marathon. He walked as if his life depended on it—and in some ways it did. One day, he fell on the slope in front of his house and suffered a proximal humerus fracture.

Following the injury, my neighbor's walking slowed dramatically. Approximately 6 weeks after the injury, I visited him at his house. He was a different man. His arm remained in a sling, he was clearly in pain, his movements were slow, his legs were edematous, and he wore plastic oxygen tubing around his ears connected to a machine in another part of the house. Although people were visiting him and bringing him meals, he was clearly past the stage of independent living. Soon after, he moved into an assisted living facility. Within a year of his fall, he died.

My neighbor's story is unfortunate, but common. Some have described the volume of injuries in older adults as an epidemic, as evident in research titles such as "ATV deaths in older adults in West Virginia: Evidence suggesting that '60 is the new 40!'" and "Bicycle-related injuries among the elderly–evidence of a new epidemic?" Even the proportion of mountaineering accidents involving older adults has increased [1]. This increase is an unfortunate result of a great public health success: today there are more active and independent older adults than at any time in our nation's history. For those who survive their injuries, the primary consequences are chronic pain and physical disability. This commentary discusses our current research in this area, which aims to understand and prevent these consequences.

Reducing the Burden of Acute Musculoskeletal Pain

In our cohort of 211 older adults who presented to the emergency department (ED) after a motor vehicle collision (MVC), 26% had continued moderate or severe collision-related pain at 6 months [2]. Patients with persistent pain were more likely to report functional decline, reduced self-rated health, and a change in living situation to obtain additional help. In order to reduce the burden of persistent pain and disability resulting from acute musculoskeletal pain, several questions need to be answered: How can we optimize pharmacologic therapy in the early recovery period? What is the role of physical activity, physical therapy, and rehabilitation in recovery? How does a patient's psychological response to the injury impact outcomes? Can we intervene to promote a healthy psychological response? And what supports are necessary for transitioning from emergency department care to primary care?

How Can We Optimize Pharmacologic Therapy in the Early Recovery Period?

Empirical evidence supports the importance of the early recovery period in shaping long-term outcomes after injury. In our longitudinal study of older adults receiving ED care after a MVC, most improvements in pain occurred in the first 6 weeks [2]. Longitudinal studies of other acute musculoskeletal pain conditions (eg, back pain) also indicate that most recovery occurs in the first 4 to 6 weeks [3, 4]. Interventional studies support the value of early analgesic treatment. For example, during the first week after orthopedic surgery, older adults who received standing doses of

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analgesics and analgesics prior to physical therapy sessions had less long-term pain and better functional outcomes than those who did not [5]. Early pain management may be particularly effective in improving long-term outcomes because analgesics can deactivate stress pathways that likely contribute to the development of chronic pain [6-9].

Unfortunately, the pharmacologic treatment of acute musculoskeletal pain in older adults is challenging, often ineffective, and carries a high risk of side effects and serious adverse events. Acetaminophen, nonsteroidal anti-inflammatory drugs (NSAIDs), and opioids provide clinically significant reductions in pain for several hours, and combinations of these medications provide superior analgesia compared to treatment with a single agent [10, 11]. However, many patients, particularly older adults, lack the basic knowledge necessary to determine whether they can safely take these medications and how to anticipate and avoid side effects. For example, half of all ED patients do not know if Tylenol contains acetaminophen, and the majority do not know if Vicodin or Percocet contains acetaminophen [12]. Related to this knowledge gap, accidental acetaminophen toxicity results in hundreds of deaths and about 15,000 hospitalizations in the United States each year [13]. Similarly, many patients do not know that NSAIDs are contraindicated in patients with heart failure, renal failure, or a history of gastric ulcers, and have dangerous interactions with medications commonly used to treat hypertension and diabetes [14]. In our study of older ED patients with musculoskeletal pain, less than half were able to classify Motrin, Aleve, or naproxen as either an NSAID, an opioid, or acetaminophen [15]. Opioids frequently cause nausea, vomiting, constipation [16], and falls, yet most older adults do not anticipate or know how to avoid or mitigate these problems [17]. Alternative therapeutic options, including regional anesthesia, topical treatments, and nontraditional agents such as gabapentin also have the potential to improve outcomes. The urgency for improved approaches to the pharmacologic management of acute pain is heightened by the epidemic of opioid addiction and opioid-related overdose [18]. Following a new prescription for an opioid by an ED provider, about 1.5% of patients are still using opioids at 1 year, and 5.3% are still using opioids at 9 years [19, 20].

Thus, pharmacologic therapy is an important part of the solution, but requires patient education to avoid inappropriate medication use and to anticipate and avoid side effects and adverse events. We have developed an interactive video to provide this education. Our pilot clinical trial data suggest that the combination of the ED-based video plus phone call follow-up 48 to 72 hours following discharge can significantly improve pain outcomes at one month. Given the ranges of treatment options, patient comorbidities, and preferences regarding pain control versus avoiding side effects, we see shared decision-making as an essential strategy in deciding on an initial pain management plan [17, 21]. By providing the patient with essential knowledge, the video is intended to promote shared decision-making during the ED visit.

What is the Role of Physical Activity, Physical Therapy, and Rehabilitation in Recovery?

People of all ages can improve their health by routinely partaking in moderate physical activity. Following injury, older patients are at high risk for experiencing a drop in their capacity for physical function and, consequently, a decrease in their physical activity. Although some rest following an injury is appropriate for most patients, a conscious effort to return to pre-injury levels of activity over the first few weeks goes a long way to protect the patient's physical and mental health. In our cohort of older adults experiencing MVC, those whose physical activity at 6 weeks had significantly decreased from pre-injury levels had higher pain scores and greater disability at 6 months [22]. A number of studies have shown that interventions can produce sustained increases in physical activity. Interventions to support physical rehabilitation for older adults with musculoskeletal pain or musculoskeletal surgical patients are well established and routinely used in clinical practice [23, 24]. However, how best to promote physical activity during the early recovery period for patients seen in the ED and then discharged home is less well understood. This is a critical issue because the majority of older adults with musculoskeletal injuries, including the humerus fracture described earlier, do not require or meet criteria for inpatient care [25]. Evidence does suggest that the high negative affect that patients experience in the setting of acute pain may stimulate increased critical thinking and allow patients to be more open to behavior modification [26]. How to promote physical activity, how to integrate this activity with pharmacologic therapy, and if there is a role for physical therapists in supporting and guiding the return to activity in injured older adults remain important, unanswered questions.

How Does a Patient's Psychological Response to the Injury Impact Outcomes, and Can We Intervene to Promote a Healthy Psychological Response?

Musculoskeletal injuries can profoundly impact an individual's self-esteem. This is particularly true in older adults because many realize that recovery can be difficult and that their ability to compensate for an injury to preserve their independence may be limited. In our cohort of older adults experiencing MVC, those who suffered from depressive symptoms prior to the collision had higher rates of persistent pain [2]. Similarly, depression is a major risk factor for persistent pain among older adults with acute low back pain [27]. Treating long-standing depression in older adults with a new injury is likely to be difficult, but preventing the development of depression and decreased self-esteem in older adults with an injury may be more achievable and may be a critical component of optimizing recovery. For older adults

experiencing life-threatening forms of trauma, which can include both MVCs and falls, post-traumatic stress disorder (PTSD) can also impact health outcomes. In our cohort, 21% of older adults experiencing MVC had clinically significant PTSD symptoms at 6 months [28]. Older adults who have fallen have an estimated prevalence of clinically significant PTSD symptoms of 27.5% over the following 2 to 6 months [29]. Patients with PTSD symptoms after MVC have almost twice the rates of persistent pain and functional decline as those without PTSD symptoms. Thus, addressing the psychological consequences of injury may be as important as treating a patient's pain. Doing so will likely require methods of identifying patients at risk for adverse psychological responses to injury and connecting these patients to cognitive behavioral therapies and medications. For patients in a close relationship, interventions that enhance the spouse's response to the patient's injury may also be valuable [30].

What Supports Are Necessary for Transitioning From Emergency Department Care to Primary Care?

EDs are the dominant site of care for patients with acute musculoskeletal injury. In 2014, individuals aged 50 years and older made 43 million ED visits, about 20% (8.5 million) of which were for the evaluation of acute musculoskeletal pain [31]. The majority of patients are discharged home following the ED evaluation and do not see their primary care provider for at least a week after the ED visit [32, 33]. Therefore, any efforts to improve the initial treatment of these patients will greatly benefit from ED-based interventions. Although emergency providers may be able to recognize patients at high risk for persistent pain and functional decline, and initiate some interventions, not all of this work can be done in the ED. Thus, an effective transition from emergency care to primary care is likely to be an important component of the effective management of an injured older adult [34]. Standardized communication between the emergency provider and primary care provider is a critical step in supporting this transition [35]. This communication may facilitate early follow-up, which is particularly important for patients with ongoing pain symptoms because modifications to treatment are essential to optimize pain care and avoid adverse events [36].

Conclusion

Musculoskeletal injuries resulting in persistent pain and disability take a tremendous toll on the health of older adults. The complexity of the problem requires a multifaceted, patient-tailored solution. While there are many unanswered questions, it is likely that outcomes can be substantially improved by better targeting of existing pharmacologic therapies, promoting physical activity, and addressing unhealthy psychological responses. Additional research is needed to develop interventions that achieve these goals and study their effectiveness. In the long-term, increased awareness of the problem, early initiation of interventions, and coordination of care has the potential to decrease the burden of chronic pain and disability for this growing and vulnerable population. NCMJ

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