Hand and Finger Injuries

This edition of *FP Essentials™* will update family physicians about hand and finger injuries and will cover four sections: metacarpal and phalangeal fractures, thumb injuries, acute tendon and ligament injuries, and chronic digit conditions.

This edition should be approximately 10,000 words in length, divided into four sections of approximately 2,500 words each (each with an abstract of 200 words or less) plus key practice recommendations, a maximum of 15 tables and figures, recommended reading, and approximately 100 references. This edition should focus on what is new in each topic and should answer the key questions listed for each section. Each section should begin with an illustrative case, similar to the examples provided, with modifications to emphasize key points; each case should have a conclusion that demonstrates resolution of the clinical situation. The references here include information that should be considered in preparation of this edition. However, these references are only provided as a useful starting point that should be used to identify additional information to review.

Needs assessment: Hand and finger injuries account for many visits to family physicians. Indeed, finger and metacarpal fractures are the first- and second-most common types of fracture seen in family care practice. Although most phalangeal and metacarpal fractures heal well without complications using nonsurgical management, poor healing (angulations and malrotations) can occur because of the numerous forces of tendons and ligaments across these fractures. Family physicians should be able to recognize these factors and institute appropriate managements or referrals when appropriate. Ligament and tendon injuries of the fingers also are important, and family physicians typically are the first to evaluate patients with these conditions. Improper management of these issues can result in deformity and dysfunction over time. Therefore, it is essential that family physicians are knowledgeable when assessing these conditions and are able to recognize when a referral is necessary.
Section 1: Metacarpal and Phalangeal Fractures of Fingers

Example case: Marcus is a right-handed 20-year-old man who comes to your office with right hand pain after punching a wall in anger a few days ago. He notes pain over the fourth and fifth metacarpal-phalangeal joints but reports no numbness, tingling, or weakness. On examination, he has tenderness and swelling over the ulnar aspect of the dorsum of the hand. He is able to fully extend his fingers but when he makes a fist, you notice the absence of the fifth knuckle. X-rays obtained in the office show a nondisplaced simple fracture of the neck of the fifth metacarpal, with 20° of volar angulation. You decide to place him in an ulnar gutter splint and follow-up in 1 week for repeat x-rays and casting.

Key questions to consider:

Answer the following questions regarding distal, middle, and proximal phalangeal fractures:

- What is the prevalence of these fractures?
- What are the common mechanisms of injury? What ligaments and tendons commonly are injured in association with these fractures?
- What are common physical examination findings? Which x-rays should be obtained? When is advanced imaging (computed tomography scan, magnetic resonance imaging study) indicated, rather than plain x-rays? Is ultrasonography useful in the evaluation of these fractures?
- Regarding distal phalangeal fractures, what is the importance of evaluating the nail bed? Are antibiotics indicated if the nail bed is injured?
- Regarding middle phalanx fractures, discuss the management and treatment of volar plate injuries.
- What is the recommended conservative management of these fractures? How frequently should patients be seen for follow-up? When should x-rays be repeated?
- What are the indications for orthopedic subspecialty evaluation or referral? What about occupational or hand therapy?
- What are the potential complications of these fractures that may not be recognized at the time of injury, or if incorrectly healed?
- Are there special considerations when these fractures occur in children?
- When can the patient return to regular activities, including work and sports?

Answer the following questions regarding fractures of the head, neck, shaft, and base of the metacarpals:

- What is the prevalence and common mechanism of injury of these fractures? What ligaments and tendons also are commonly injured?
• What are common physical examination findings? Which x-rays should be obtained? When is advanced imaging (computed tomography scan, magnetic resonance imaging study) indicated? Is ultrasonography useful in the evaluation of these fractures?

• What is the recommended conservative management of these fractures? How frequently should the patient be seen for follow-up? When should x-rays be repeated?

• What are the indications for orthopedic subspecialty evaluation or referral? What about occupational or hand therapy? What features on physical examination indicate that a subspecialist consultation is needed? What is the best method to evaluate for rotation?

• What are the potential complications of these fractures on injury and if incorrectly healed?

• How is the management of these fractures in children different?

• When can the patient return to regular activities, including work or sports? Are any special precautions needed, and if so, what are they?

**Initial references to consider:**

Section 2: Thumb Injuries

Example case: Dianne is a 40-year-old personal trainer who fell off her bicycle this morning on her way to work. She has pain at the base of her left thumb. On examination, you note some deformity, swelling, and tenderness around the base of the first metacarpal region. She has some restriction of thumb movement, but no neurovascular deficits. Tendons seem intact with no associated injury. A three-view x-ray series of her hand shows a fracture dislocation of the first metacarpophalangeal joint (Bennett fracture). You place her in a thumb spica splint and refer her to an orthopedic surgery subspecialist for further evaluation and treatment.

Key questions to consider:

Thumb fractures:

• How common are thumb fractures and what are the most common mechanisms of injury? What are the biomechanical differences of the thumb that make the management of thumb fractures different from the rest of the fingers?

• What physical examination findings are common in thumb fractures? Which x-rays should be obtained? When is advanced imaging indicated? Is ultrasonography helpful in the diagnosis of these injuries?

• What are the most common thumb fractures? Discuss phalangeal, metacarpal intraarticular (Rolando, Bennet), and metacarpal extraarticular fractures. What ligament and tendon injuries commonly are associated with these fractures?

• Which of these fractures can be managed conservatively by family physicians? What are the best methods of immobilization?

• When treated conservatively, how often should the patient be reassessed? When should x-rays be repeated?

• What are the concerning features that may prompt referral for orthopedic subspecialty evaluation? What about occupational or hand therapy?

• What are the associated complications of these fractures?

• What considerations should be given in children with these fractures?

• When can the patient return to regular activities, including work or sports? What precautions should be taken?

Skier thumb (Gamekeeper thumb)

• What is the common mechanism of injury and which structure is affected?

• What are the physical examination findings? What are the differences in a partial versus a complete tear?

• Which x-rays should be obtained? When is advanced imaging indicated? Is ultrasonography helpful in the diagnosis of these injuries?
• What is the conservative management for the injury? Which kind of splint is used? Is there an advantage of one splint over another? How often should patients be monitored?

• What are the indications for orthopedic subspecialty evaluation?

• What are the short-term and long-term complications of this injury?

• When can the patient return to regular activities, including work or sports? What precautions should be taken?

Initial references to consider:


Section 3: Acute Tendon and Ligament Injuries

Example case: Cole is an 18-year-old basketball player at the local high school where you volunteer as the team physician. Last evening, during the game, his middle right finger was jammed during a pass. The athletic trainer buddy taped his fingers together and he was able to finish the game. This morning when he woke up, he noticed he was not able to straighten the tip of his finger. On examination, he has tenderness and mild swelling over the distal interphalangeal (DIP) joint. He is unable to actively extend the distal portion of his finger, but you can passively extend it. He has no problem flexing his finger. There is no neurovascular injury. Three-view x-rays of the finger show a small avulsion fracture on the dorsum of the proximal aspect of the distal phalanx with no volar subluxation. After discussing the options, you decide to place him in a mallet finger splint over the distal dorsal portion of his finger, immobilizing the DIP joint in slight hyperextension. He understands he needs to keep the splint on and the finger in extension even during skin hygiene for the next 12 weeks.

Key questions to consider:
Answer the following questions regarding mallet finger, jersey finger, central slip extensor tendon injury (boutonnière deformity), with separate subsections for each of those injuries:

- Describe each of the injuries and the anatomical structure that is disrupted.
- What is the common mechanism of injury? Is it more common in men or women? Which finger is most commonly injured?
- What are the physical examination findings? What are the differences in a partial versus a complete tear?
- Which x-rays should be obtained? When is advanced imaging indicated? Is ultrasonography helpful in the diagnosis of these injuries?
- If there are subtypes of these injuries (eg, for jersey finger), which type should be managed with more urgency?
- What is the conservative management for the injury? Which kind of splint is used? Is there an advantage of one splint over another? How often should patients be monitored?
- When are corticosteroid injections indicated and contraindicated?
- What are the indications for orthopedic subspecialty evaluation?
- What are the short-term and long-term complications of this injury?
- What are the considerations in children with these injuries?
- When can the patient return to regular activities, including work or sports? What precautions should be taken?

Initial references to consider:


Section 4 : Chronic Digit Conditions

Example case: Murray is a 68-year-old man with diabetes who comes to your office with left hand stiffness that started with a nodule on the palm of the hand. Subsequently, he has developed some difficulty extending the fourth and fifth digits as well as grasping and holding objects. The symptoms have worsened over the past 2 months. On examination, you notice some puckering of the palm of the hand, which worsens as he tries to extend his fourth and fifth digits. You also note the presence of a palpable cord running longitudinally on the hand which limits the extension of the metacarpophalangeal and proximal interphalangeal joints. The area is mildly tender. The examination is otherwise unremarkable.

Key questions to consider:

Trigger finger

• What is the prevalence in the population? What is the mechanism of injury and the underlying etiology?
• What medical conditions are associated with its development? What are additional risk factors in development?
• What are the symptoms and physical findings? How can it be differentiated from Dupuytren contracture? Can the two conditions be associated?
• What is the initial management? What are the roles of immobilization and occupational therapy?
• When is a corticosteroid injection indicated? What are the indications for surgical evaluation?
• What considerations should be given in children presenting with this condition?
• What is the role of point-of-care ultrasonography in the family physician’s office to aid in diagnosis and management?

Dupuytren contracture (palmar fibromatosis)

• How common is this condition in the population? Who is at increased risk of developing it?
• What other medical conditions may increase the risk of its development? What are other risk factors?
• What is the pathophysiology? What are the presentation, symptoms, and physical examination findings? Which fingers typically are affected?
• What are the goals of management? Describe the management of patients with mild symptoms, those with persistent or progressive disease, and those with flexion contractures.
• What is the recurrence rate after surgical intervention? How does surgery compare with percutaneous needle aponeurectomy?

• How effective are collagenase injections in the management of this condition? Who are the best candidates? What are the complications?

• How effective is prophylactic external beam radiation therapy? Who are the best candidates? What are the complications?

de Quervain tenosynovitis

• Who is at increased risk of developing this condition? What are the risk factors associated with its development?

• What is the underlying pathophysiology? What are the presenting signs, symptoms, and physical examination findings? How can this condition be differentiated from intersection syndrome?

• What is the initial management? What is the role of home exercise, occupational therapy, and splinting?

• When is a corticosteroid injection indicated? What are the complications of this procedure? When can it be repeated?

• Is ultrasound-guided injection superior to landmark injection?

• When is surgery indicated?

**Initial references to consider:**


