NIHR Doctoral Research Fellowship

# Surgical Site Infection following Surgery for Hand and Wrist Trauma

Traumatic injuries of the hand and wrist are some of the most common injuries that present to the emergency department in the United Kingdom, accounting for around 20% of all injuries. There were nearly 60,000 hand injuries in the UK between 2014-2015 requiring hospital treatment. Wrist injuries are also very common, with broken wrists alone occurring in an estimated 70,000 patients per year in the UK. Across the spectrum of injuries, they occur in all age groups but are most common in the young working population and the elderly population.

The structure and function of the hand and wrist is complex. The hand and wrist are composed of 29 bones (27 hand bones, the radius and ulna), all of which can be broken. There is also a variety of soft tissues, including muscles, tendons, ligaments, nerves and blood vessels that may be damaged through injury. The intricate relationship of all of these structures gives the human hand and wrist its extraordinary range of movement and function. Damage to any of these structures therefore can lead to significant functional impairment, reduced quality of life and potentially long-term disability.

Infection following surgery is a recognised complication in hand and wrist trauma, with a risk of 4-30% depending on the injury and treatment. On a global scale, infection at the site of the surgical procedure, known as surgical site infection has been recognised by the World Health Organisation as a research priority. There are a variety of procedures and interventions that are undertaken to reduce the risk of SSI. One particular intervention that has been evaluated in some surgical specialties is the use of antimicrobial sutures. These work in the same way as conventional sutures but are coated in an antimicrobial substance, such as triclosan, which can resist bacterial growth. This in theory reduces the risk of bacteria sticking to the suture material and infecting the wound. The research available suggests that they do reduce the risk of SSI in certain surgical procedures, but no one has looked at whether this is also the case for hand and wrist trauma.

The purpose of this research programme is to quantify the risk of SSI in hand and wrist trauma through a systematic review of clinical trials in hand and wrist trauma, to quantify the benefit of antimicrobial sutures through systematic review and meta-analysis of the available clinical trials of antimicrobial sutures, to assess the current rate of SSI in hand and wrist trauma in the United Kingdom through analysis of routinely collected big data sets and to develop and run a feasibility clinical trial of antimicrobial sutures versus conventional sutures for hand and wrist trauma.