



Time after time: individuals with multiple fractures and injury recidivists in long eighteenth-century (c. 1666–1837) London

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ABSTRACT

Investigating injury recidivism and individuals with multiple injuries is an area of growing interest in bioarchaeology. Differentiating between whether an individual sustained multiple injuries, represented by antemortem healed fractures, in one incident or in multiple incidents over the life course, is a major challenge. This research analyzed the skeletal remains of 721 adults (402 males, 319 females) from five post-medieval cemeteries from London, UK, known to include working class individuals for evidence of skeletal trauma – fractures, *myositis ossificans*, subluxations/dislocations, blunt force trauma, and sharp force trauma. A total of 164 individuals had more than two fractures; males were significantly more likely to have multiple (2+) fractures than females. An investigation of fracture recidivism incorporating a relative timeline of fracture events was possible because 14 individuals (12 males, two females) were identified as injury recidivists, meaning they had a combination of antemortem healed, antemortem healing, and/or perimortem fractures. This paper examines the distribution and relative timing of these fractures, incorporating contemporary clinical as well as social and historical context, noting that the majority of the fractures were likely to be caused by accidental mechanisms.

1. Introduction

Injury recidivism is both a contemporary health problem and a challenging subject to access in bioarchaeology. The term *trauma recidivist* was introduced to the clinical literature by Reiner et al. (1990), following the example of Sims et al. (1989) who noted that repeated trauma should be considered a chronic disease. Reiner et al. (1990) outlined the clinical definition of an injury recidivist as a male of low socioeconomic status with a mean age of 26 years, who within a few years of his first admission (at the average age of 20 years) would suffer another fracture or injury. Further clinical literature quickly adopted the term in many key studies based upon urban American hospital admittances (e.g., Cesare et al., 1990; Goins et al., 1992; Hedges et al., 1995; Kaufman et al., 2016; Kaufmann et al., 1998; Kennedy et al., 1996; Madden et al., 1997), many of which focused upon deviant and violent behaviour. Clinical interest in recidivism continues apace, with broader international studies (e.g., Caufield et al., 2004; Dowd et al., 1996; Sayfan and Berlin, 1997) and increased attention to gendered, social, and demographic contexts that may influence exposure to repeated trauma (e.g., Kwan et al., 2011; Richardson et al., 2016; Rogers

et al., 2014; Toschlog et al., 2007).

Judd (2002a) was the first to apply the concept of recidivism to bioarchaeology, investigating and comparing multiple injuries in ancient Nubian individuals. She determined that many of these ancient individuals aligned with the clinical definition of an injury recidivist and identified differences in fracture type and distribution between rural and urban groups. This key study laid out criteria for the investigation of injury recidivism in archaeological samples: adults must be grouped by age and sex; data should be grouped as individuals with no fractures, one fracture, and two or more fractures; and all injuries must be included. Judd (2017); Judd and Redfern (2012), and Redfern et al. (2017) outline the challenges in trauma research in bioarchaeology, and studies of recidivism specifically. As Judd (2002a, p. 93) asserts, “in clinical investigation, injury recidivism is determined by the number of times that an individual sought medical treatment for injury, but the exact number of injuries presented on each occasion are often unstated.” In bioarchaeological studies, it is generally impossible to determine the total number of episodes in which individuals suffered multiple fractures (due to the remodeling of fracture calluses); therefore, researchers must use the total number of fractures per individual

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to access recidivism, with the understanding that the clinical definition differs from what is possible to assess in bioarchaeological research. In addition, any injuries to soft tissue will not be visible, thus the frequency of injuries is likely to be an underestimation of the true number.

Defining terms is a critical issue. Redfern et al. (2017, p. 426) suggest that the most parsimonious term for those with evidence of multiple fractures is “individuals with multiple injuries”, rather than injury recidivist, or an individual with polytrauma. Judd (2017) provides a useful outline of limitations within clinical injury recidivism research, particularly the use of varied terminology. Varied trauma recording systems, in both bioarchaeological and clinical contexts, limit the comparability of many published studies. In this study, the term *individual with multiple injuries* is used to describe individuals who have two or more antemortem healed injuries. The term *injury recidivist* in this context is used to describe individuals with two or more injuries in which there is a mixture of antemortem healed, healing, and/or perimortem trauma.

In the less common cases in which injuries are observed in varied stages of healing, more detailed conclusions may be drawn about injury events. It is possible to access potential information concerning morbidity and mortality if an individual has one or more injuries undergoing early stage healing in addition to one or more well-healed injuries, or a combination of perimortem and antemortem trauma. Potential abuse in vulnerable individuals such as children (Walker et al., 1997; Wheeler et al., 2013) and the elderly (Gowland, 2016) may be visible and the timing of fractures provides key insights into violent incidents in the past (Orschiedt et al., 2003; Šlaus et al., 2012; Spencer, 2012).

The publication of *Broken Bones, Broken Bodies* (Tegtmeyer and Martin, 2017), an edited collection focused on accumulative trauma, reveals the wealth of information that it is possible to uncover in archaeological and forensic contexts regarding multiple injuries and the interest in bioarchaeology of teasing apart the tangled web formed by multiple injuries. The authors all acknowledge the inherent limitations facing bioarchaeologists, but demonstrate that a holistic approach to skeletal studies of multiple injuries may reveal embodied evidence of repeated accidents, social upheaval, structural violence, and victimization.

The skeletal remains of the labouring poor of London, UK, during the long eighteenth century (c. 1666–1837 AD) record the risks and stresses of living in a bustling metropolis during a time of political, economic, and social change. The presence of fractures, subluxations/dislocations, *myositis ossificans*, and sharp/blunt force trauma in these remains was examined to provide information concerning the injury risks and experiences of people in the past throughout their life course. The observed skeletons were divided into individuals with multiple injuries and injury recidivists; in 14 cases a relative reconstruction of traumatic events was possible. These injuries are contextualized using historical sources of contemporary physician and surgeons' descriptions of trauma cases admitted to London's voluntary hospitals, charitable

institutions providing health care for the working poor, suggesting that accidental trauma due to urban overcrowding and occupational hazards were probably the most common mechanisms for the observed injuries.

2. Materials and methods

Five post-medieval skeletal collections derived from archaeologically excavated cemeteries were identified for examination through the Museum of London's Centre for Human Bioarchaeology online cemetery summaries. These cemeteries were associated with working-class individuals (Brickley and Miles, 1999; Fowler and Powers, 2013; Henderson et al., 2013; Jones, 1991; Kausmally, 2008); all are curated at the Museum of London Centre for Human Bioarchaeology (Table 1); their locations are marked in Fig. 1 on John Rocque's 1749 map of London.

2.1. Cemeteries

2.1.1. St. Bride's lower churchyard (FAO90)

St. Bride's lower churchyard is located within the parish of St. Bride's, London, on Farringdon Street. The lower churchyard is one of three burial locations in the parish; the other two, the main churchyard and the church crypt, are associated with St. Bride's Church, Fleet Street. Parish burial grounds generally charged different rates depending upon the burial location in the cemetery; St. Bride's had no such differentiation and therefore it was the poorer members of the parish, lodgers, inhabitants of the Bridewell workhouse, and individuals from the Fleet prison who were laid to rest in St. Bride's (Kausmally, 2008).

2.1.2. Royal London Hospital (RLP05)

The Royal London Hospital, founded in 1740, was built facing Whitechapel Road, in east London. It received its Royal designation in 1990 at its 250th anniversary. It was necessary during the eighteenth and nineteenth centuries for hospitals to make provisions for patients who died in care with no one to claim their bodies or pay for burial; these individuals comprise the skeletal sample from RLP05, buried between 1825 and 1841/2 (Fowler and Powers, 2013). In contrast to other general hospitals in London (with the exception of the Westminster), the Royal London Hospital did not charge a burial fee; therefore, the hospital charity covered the costs of burial (Fowler and Powers, 2013; Howard, 1791).

2.1.3. Payne Road/Bow Baptist (PAY05/BBP07)

Bow Baptist Church was founded on 21 June 1785, when Bow was a large village outside London, located between the parish church of St. Mary, Bow and the River Lea (Henderson et al., 2013). A single surviving burial register covers the period from 13 April 1816 and 1 July 1837, though the burial ground was not closed until the end of 1853 by Order of Council (Henderson et al., 2013). The register records the

Table 1
Museum of London cemetery and adult (18 years +) skeletal sample overview.

| Cemetery Site | Museum of London Site Code | Cemetery Use Dates (Skeletal Sample Date, AD) ^a | Number of Skeletons Studied | |
|----------------------------------|----------------------------|--|-----------------------------|---------|
| | | | Males | Females |
| St. Bride's lower churchyard (A) | FAO90 | 1770–1849 | 190 | 125 |
| Royal London Hospital (B) | RLP05 | 1825–1841 | 80 | 30 |
| Payne Road and Bow Baptist (C) | PAY05/BBP07 | 1816–1854 | 83 | 110 |
| Cross Bones (D) | REW92 | 17th century – 1853; mid-19th century | 12 | 27 |
| St. Thomas' Hospital (E) | NLB91 | 17th century | 37 | 27 |
| Total | | | 402 | 319 |

^a Date information from: Miles and Conheeny (2005); Henderson et al. (2013); Brickley and Miles (1999); Jones (1991), and Fowler and Powers

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