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Radiologic Discrepancies in Diagnosis of Fractures in a Dutch Teaching Emergency Department: a retrospective analysis

Background: Missed fractures at the Emergency Department (ED) are common and may lead to patient morbidity. At our general teaching hospital, radiographs are initially interpreted by attending ED physicians and clinical practice is dependent on these interpretations.

Aim: To determine the rate and nature of radiographic discrepancies between ED attending physicians, radiologists and trauma/orthopedic surgeons and the clinical consequences of delayed diagnosis. A secondary outcome measurement is the timeframe in which most fractures were missed.

Methods: A single-centre retrospective analysis of all missed fractures from 2012-2017 was performed. As common practice; missed fractures were documented in a complication list and put in a database. Required additional data were retrieved from the electronic medical records.

Results: A total amount of 25.957 fractures were treated at our ED. Initially, 289 were missed by ED attending physicians (1.1%). The most frequently missed fractures are the elbow (28.5%) and wrist (20.8%) in children, the foot (17.2%) in adults and the pelvis and hip (37.3%) in elderly. Patients needed surgery in 9.3% of missed fractures, received immobilization by a cast or brace in 45.7%, had no treatment alterations during the first week in 38.1% and in 6.9% follow up data were lacking. 49% of all missed fractures took place in between 4 PM and 9 PM. There is a discrepancy in percentages of correctly diagnosed fractures and missed fractures between 5 PM and 3 AM.

Discussion: Our incidence of 1.1% radiographic discrepancies in both pediatric and overall population, is comparable to the incidence of other institutions. The type of missed fractures are also in accordance with figures in the literature. Calculated on bases of the whole population, discrepancy between radiographic reads led to treatment alterations in 0.7% of cases, compared to 1-3% in other studies. There is a higher incidence of missed fractures after office hours, possible explanations could be a higher threshold of consulting the attending radiologist or crowding at the ED during early evening hours.