

AM Ortho Breakout II: Part 2
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Creating a Hip Fracture Registry

Since the adoption of the electronic medical record database (HealthConnect) in 2005, 13,821 fractures of the proximal femur have been treated in the Kaiser system. A hip fracture register is being created to capture this data. The aim of the register is to collect epidemiological data, evaluate the outcomes of different treatment methods for different patient populations, and identify the factors that influence outcome for this prevalent injury.

Important lessons have been learned from the existing total joint arthroplasty and anterior cruciate ligament reconstruction registers within the Kaiser system, as well as from hip fracture registers in Northern Europe. Specifically, the hip fracture register is being designed so that cases can be entered into the registry without relying on surgeons filling out entry forms.

Imperfect physician reporting rates are an endemic problem with registries, even in a captured health system. The Norwegian register provides an interesting comparison to the Kaiser system. With a population of 4.7 million and 55 hospitals registering hip fractures, the Norwegian model is comparable in size (within the same order of magnitude) to our system.

The Norwegians established a hip fracture register in 2005 and reported only 64% and 79% completeness of registration in the first two years.¹ Reporting rates within our existing registers is improving, but because hip fractures are treated by a vast number of physicians within our system, eliminating the entry form is a priority.

The first hurdle in the creation of the register was therefore to demonstrate that cases could be registered passively by scouring the electronic databases for diagnosis codes. In addition to demographic data, these databases also allow other important elements to be automatically entered into the register. These elements include: anthropomorphic measures (patient height and weight), anesthesia type, American Society of Anesthesiologists (ASA) score, total operative time, implant data, presence of pharmacological treatment for osteoporosis, bone densitometry history, and complications requiring readmission and reoperation.

Another crucial element of the database which will require ongoing retrospective review is fracture classification. Although treatment of proximal femur fractures can be captured from the electronic record, this record has not provided a reliable or refined classification of the injuries. This problem is not unique to our system; in the annual report of the Swedish registry, it was noted that the greatest source of error was probably carelessness in ICD-10 coding.²

We have selected the Orthopedic Trauma Association (OTA) fracture classification system. A pilot review of radiographs has provided a prediction of the manpower which will be required to review and classify more than 3000 new hip fracture radiographs annually. Periodic inter- and intra-observer reliability will be documented.

Capturing outcomes data in the hip fracture population will be the greatest challenge. Mortality data are not automatically recorded in the HealthConnect database, unless a patient expires while in the hospital. Independent review of public records will be required to document this important information.

Outcomes with respect to pain, quality of life, and residual disability will be the most difficult to obtain. The Norwegian register automatically sends follow-up questionnaires to patients at four, 12, and 36 months postoperatively. But they reported only 58% of the patients returning the four month questionnaire.¹ Numbers like these make it clear why there is a paucity of outcomes data for hip fractures in the orthopedic literature.

The next step in creation of the Kaiser Permanente hip fracture register will be to test our ability to obtain meaningful outcomes measurement, perhaps through a pilot study of mailed questionnaires. We will also formulate a set of clinical, demographic, and economic questions that we would like the registry data to answer. This will help direct the capture of required data elements.

¹ Jan-Erik Gjertsen^{1,2}, Lars B Engesaeter^{1,2}, Ove Furnes^{1,2,3}, Leif Ivar Havelin^{1,2}, Kjersti Steindal¹, Tarjei Vinje¹, and Jonas M Fevang¹. The Norwegian Hip Fracture Register. Experiences after the first 2 years and 15,576 reported operations. *Acta Orthopaedica* 2008; 79 (5): 583–593

² Kärholm J, Garellick G, Rogmark C, Herberts P. Swedish Hip Arthroplasty Register. Annual report 2007.