Preface

In this year's report we have chosen a different layout which we hope will give a better reader experience. We have also left out some of the data available in previous reports in order to make the report a little easier to digest. Some data was left out because it was considered of little interest to most readers. Survival data on implants, regarding re-operation was left out as the data is considered inadequate, as we are missing data on mortality of the patients. We hope to rectify this with the validation of the database using LPR-data.

We have also chosen only to present department specific data for the data generated in 2018, and not the cumulated data from each specific department.

We welcome any feedback on the report and hope you will enjoy it.

The annual report from the Danish Fracture Database (DFDB) 2018 is the fifth of its kind. It contains data based on over 90.000 fracture related surgeries, of which over 74.000 are primary surgeries registered at www.dfdb.dk. The purpose of DFDB is web based quality monitoring of fracture related surgery. Today these efforts are joined by 21 orthopedic departments in Denmark, covering close to 90% of the Danish population. The effort to monitor quality of fracture related surgery in Denmark is unique and important 1) Unique because DFDB is the fracture register with the highest national coverage in the world and 2) important given the high number of surgeries performed each year probably making fracture surgery/ traumatology one of the busiest specialties within orthopedic surgery. Previously it has not been possible to assess nationwide quality of all fracture related surgeries.

We wish to thank all the participating surgeons and departments taking part in this unique and important task. It is truly inspirational to realize the unity DFDB has brought into orthopedic traumatology in Denmark. Also the continued support from The Danish Orthopedic Society (DOS) and Danish Orthopedic Trauma Society (DOT), and the possibility to present the annual report at the DOS Congress is much appreciated.

The area of focus this year is periprosthetic fractures. A rarer and more challenging type of fracture that often warrants cooperation between trauma and arthroplasty surgeons.

The challenges ahead for DFDB includes a validation of the database by use of LPR-data and the inclusion of implant tracking in the database. We look forward to receiving your input in shaping the future of DFDB.

Hvidovre 28/9 2018

Peter Toft Tengberg and the DFDB team

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About the Danish Fracture Database

Background and recent development

The aim of the Danish Fracture Database is to monitor the quality of surgical fracture treatment by assessing the rate of revision surgery both in general and for each fracture type specifically. This assessment results in a potential quality improvement through focus on specific fracture types where the quality of treatment is not considered high enough. Lastly, epidemiologic research in fracture surgery will contribute to identify surgical and fracture related prognostic factors for a good or poor outcome of surgery. The use of DFDB provides each participating department the possibility to monitor own data and thus the quality of their fracture treatment. The educational level of both the surgeon and the supervisor is registered and can therefore also be monitored. During the past year, there has been a marked escalation of data entry. The number of registered surgeries has increased from approximately 28.000 in 2014 to more than 90.000 in 2018.

Steering Committee

The idea behind DFDB and the registry's recent progress are attributed to Michael Brix and Anders Troelsen. Kirill Gromov contributed substantially to the registry's developmental phase. Michael, Anders and Kirill are today a part of the DFDB steering committee and are responsible for the registry's overall administration, quality monitoring, and research. In addition, each participating department is represented in the steering committee. Both DOT (Danish Orthopaedic Trauma Society) and DOS (Danish Orthopaedic Society) are represented in the steering committee. A minimum of one annual meeting is held in order to correct inexpediencies, increase the usability, and optimize the database through the members' feedback.

Secretariat and daily operations

Each participating department has a controller in daily charge of complete reporting. The daily operation is also supported by a secretariat, which was established at the Department of Orthopaedic Surgery, Hvidovre Hospital. The secretariat consists of an administrator and a statistician. Together the developers of DFDB and the secretariat have the responsibility and right for development and changes of the registry in cooperation with the provider Procordo Aps.

Summary and comments

In this annual report from DFDB we present a general overview of registered data as well as data for specific anatomical regions. The general overview covers basic demographics (age, gender and ASA score) for all primary surgeries as well as reoperations. Anatomical distribution of registered primary surgeries and reoperations as well as indications for reoperations are described. We describe the educational level of the primary surgeon and level of supervision for primary surgeries. Anatomical distribution for primary surgeries for all separate departments participating in the DFDB collaboration is described in the first part of the report.

For definitions and specifications of the different parameters please see Appendix 1.

Demographics

84% of primary procedures were due to adult fractures and 16% due to pediatric fractures.

Age distribution was biphasic, with first peak at age 0-20 and second peak at age 60-90. More males were surgically treated for fractures when age <50, while more female were surgically treated for fractures when age >50. 76% of patients with primary surgeries had ASA score 1-2 while 78% of patients with reoperations had ASA score 1-2. 56% of all registered patients were female.

Anatomical distribution

Proximal femur (35%), distal radius (15%), and malleoli (12%) were the 3 most frequent operated regions for primary adult surgical procedures. Radius/ulna (58%), humerus (22%), and tibia (9%) were the 3 most frequently operated regions for primary paediatric surgical procedures.

Reoperations

Proximal femur (27%), malleoli (20%), and distal radius (7%) were the 3 most frequently reoperated anatomical regions in adults. Radius/ulna (47%), humerus (21%) and tibia (18%) were the 3 most frequently reoperated anatomical regions in children. Pain and discomfort due to osteosynthesis material (38%), secondary fracture dislocation (15%), and infection 13%) were the 3 most frequent indications for adult reoperations. Secondary fracture dislocation (39%), suboptimal osteosynthesis (21%), and pain and discomfort due to osteosynthesis material (22%) were the 3 most frequent indications for paediatric reoperations.

Level of education

60% of all primary surgeries were performed by surgeons in training (intern- 5th year resident). Interns, 1st year resident, 2nd year resident, and 3rd year residents performed more procedures under supervision than without supervision, while 4-5th year residents, attending surgeons, and traumatologist performed more procedures without supervision than with supervision

Data limitations

There are some limitations to the data in this report. Essential limitations are:

1) Data completeness for treatment of primary fractures

2) Data completeness for reoperations

Initially, after full implementation of DFDB at the orthopaedic departments in Hvidovre and Odense, an evaluation of data validity and data completeness for treatment of primary fractures and reoperations was performed (Gromov 2013). Two plausible factors to limit data completeness were identified: 1) the registry had only been implemented for few months, and 2) both departments are large, with regularly 50-90 possible surgeons. The results of the study showed that the validity of data (the percentage of data that was correct when compared to the best external data source outside of DFDB) was 90-100% for all parameters, and most above 97%. The total degree of completeness for data entry of primary fracture treatment was 88% and for reoperations it was 77%. Thus, at an early stage after initiation of DFDB, there was a satisfactory degree of data validity and data completeness under the prevailing circumstances. Similar evaluations of data completeness should be performed continuously.

Another limitation is lacking reoperation data performed at non-participating departments where the primary operation was performed and registered at a participating department. The extent of this phenomenon can be investigated by using data from the National Patient Registry (Landspatientregistret, LPR). For this year's report, data was not extracted from LPR with regards to knowing the "true" proportion of reoperations. Therefore the proportion of reoperations are underestimated. However, as the number of departments participating in DFDB collaboration has risen to 21, covering close to 90% of the Danish population, such underestimation is significantly reduced.

Currently, work is ongoing to validate the primary fracture codes that are registered in the LPR, to know the validity of these codes if they are to be used as a data source for the DFDB. Furthermore, definition and validation of the reoperation codes in LPR to investigate the applicability of the LPR as a data source for the DFDB is ongoing.

Fracture diagnosis in Danish National Patient Registry (NPR) have been investigated by Andersen et al. The overall validity of data was 86%. The NPR diagnosis code was correct in 94% of all cases and the NPR anatomic region was correct in 99% of all cases. In 91% of all cases the operation code was correct and the anatomic region for the operation was correct in 99% of all cases. NPR coding will be used in the future for continuous completeness monitoring of DFDB data.

Data was extracted from DFDB on August 4th 2018.

References

Gromov K, Fristed JV, Brix M, Troelsen A. Completeness and data validity for the Danish Fracture Database. Danish medical journal. 2013 Oct;60 (10):A4712. PubMed PMID: 24083526.

Participating departments

Aabenraa

Aalborg

Aarhus

Bispebjerg

Esbjerg

Farsø

Gentofte

Herlev

Hillerød

Holbæk

Horsens

Hvidovre

Kolding

Køge

Nykøbing Falster

Odense

Randers

Rigshospitalet

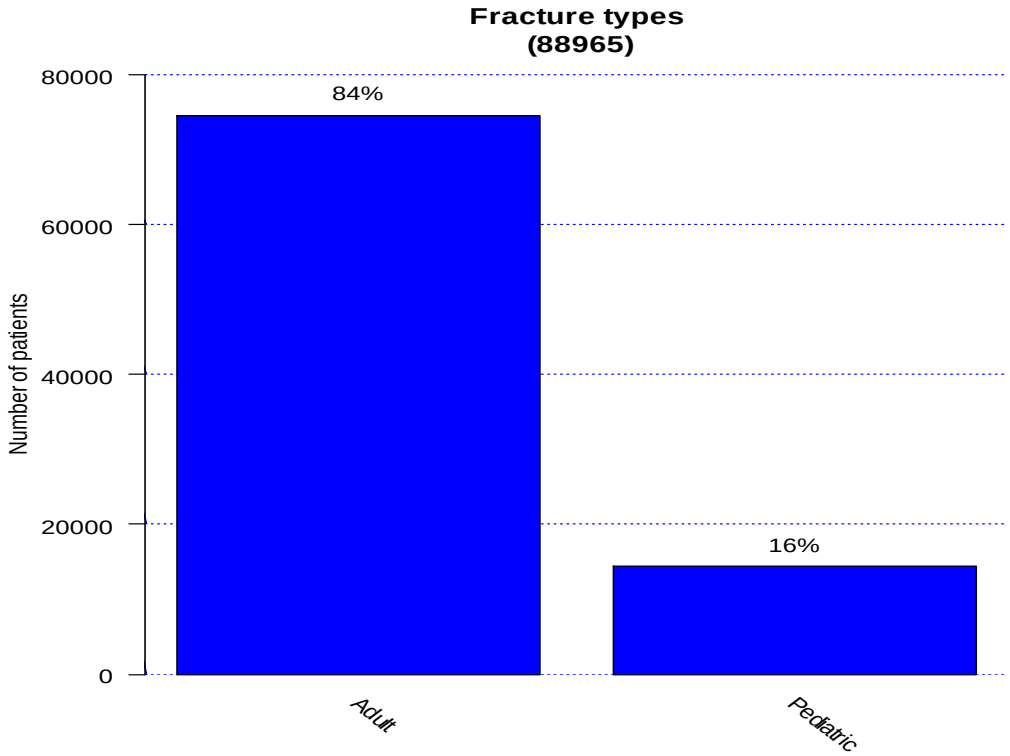
Slagelse

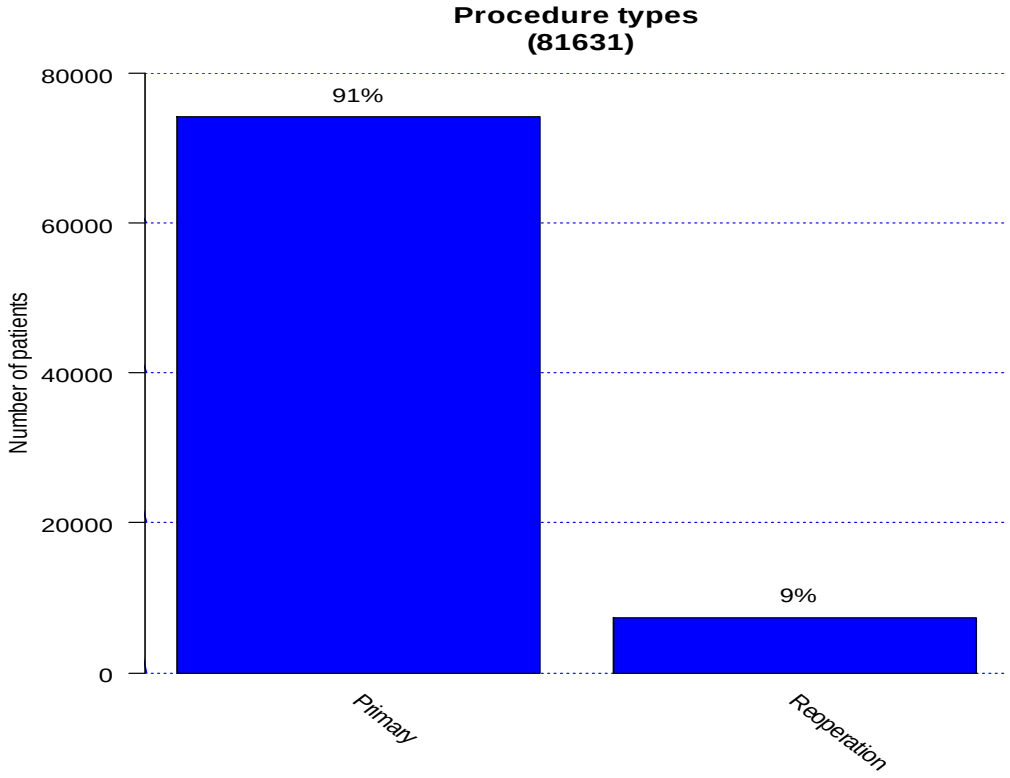
Vejle

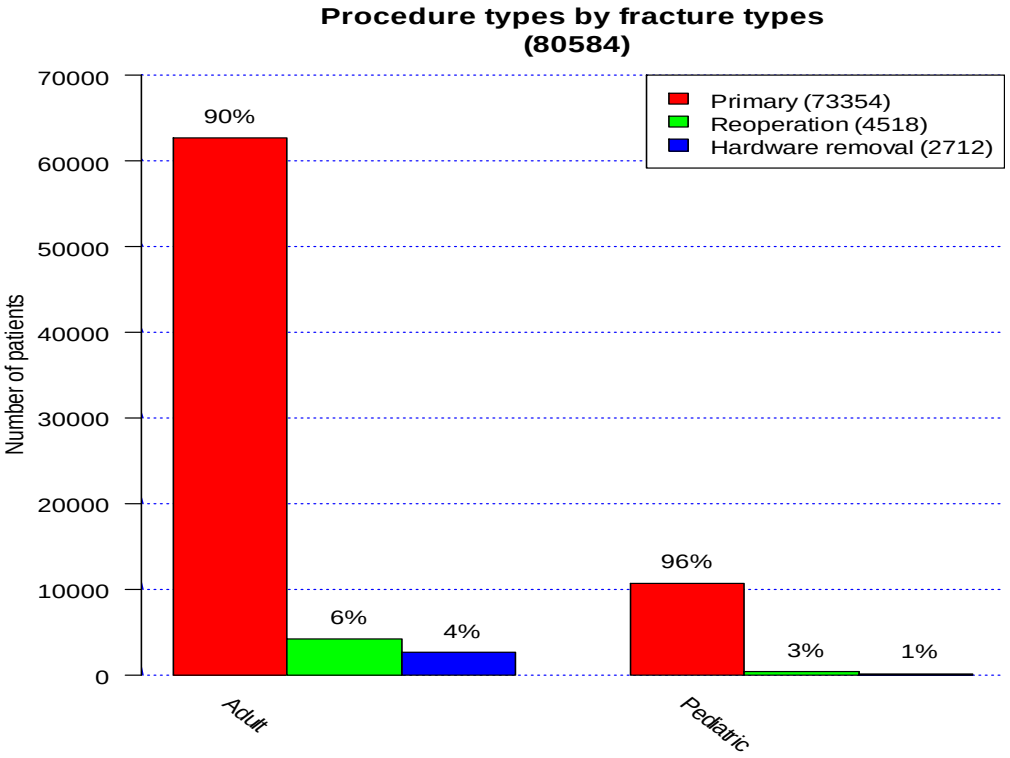
Viborg

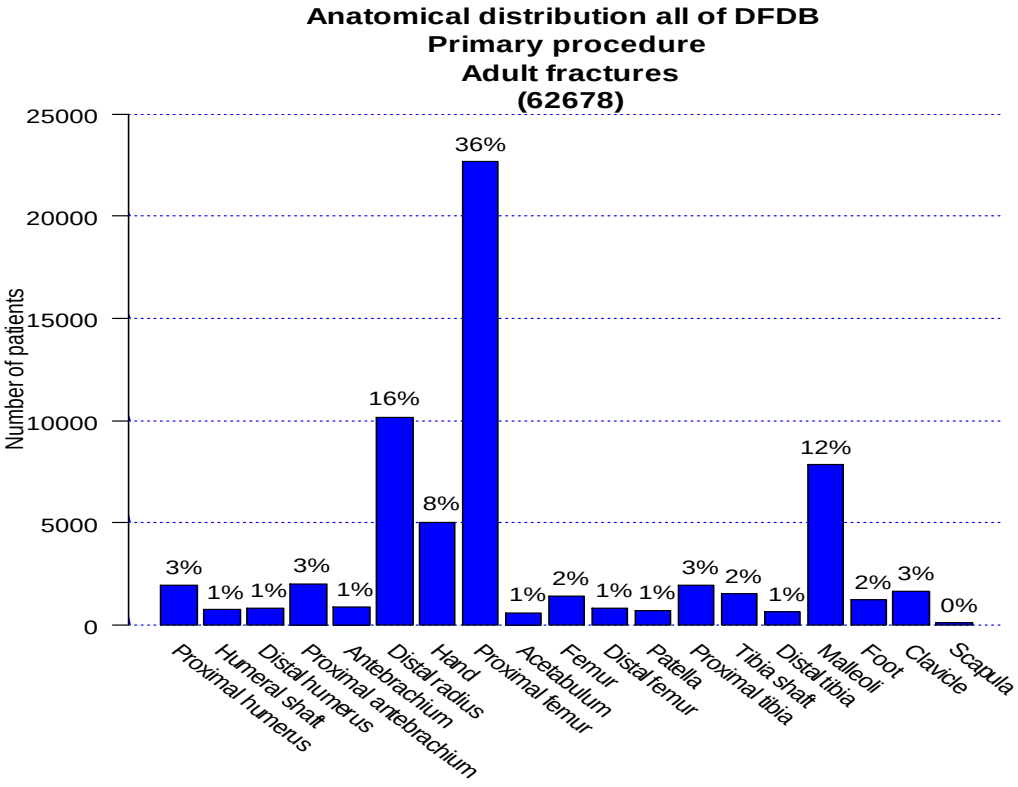
General overview of data

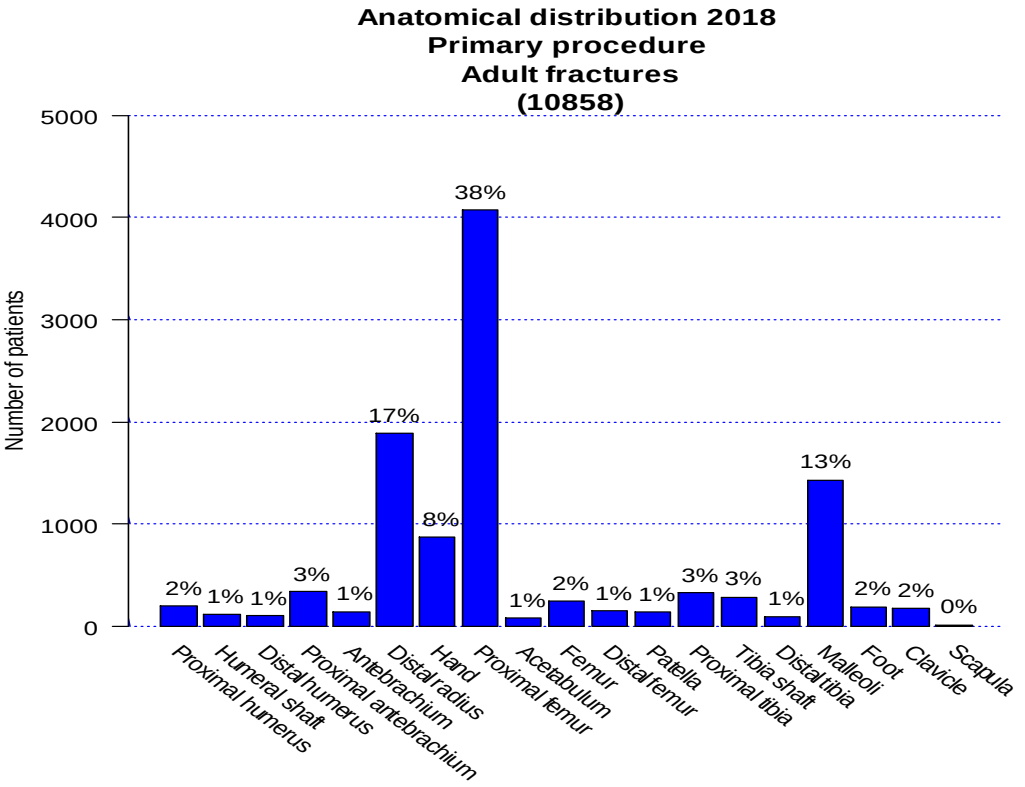
The graphs in this section covers general areas such as surgery type distribution, primary indication for re-operation, and primary surgeon, which uses data from all participating departments.

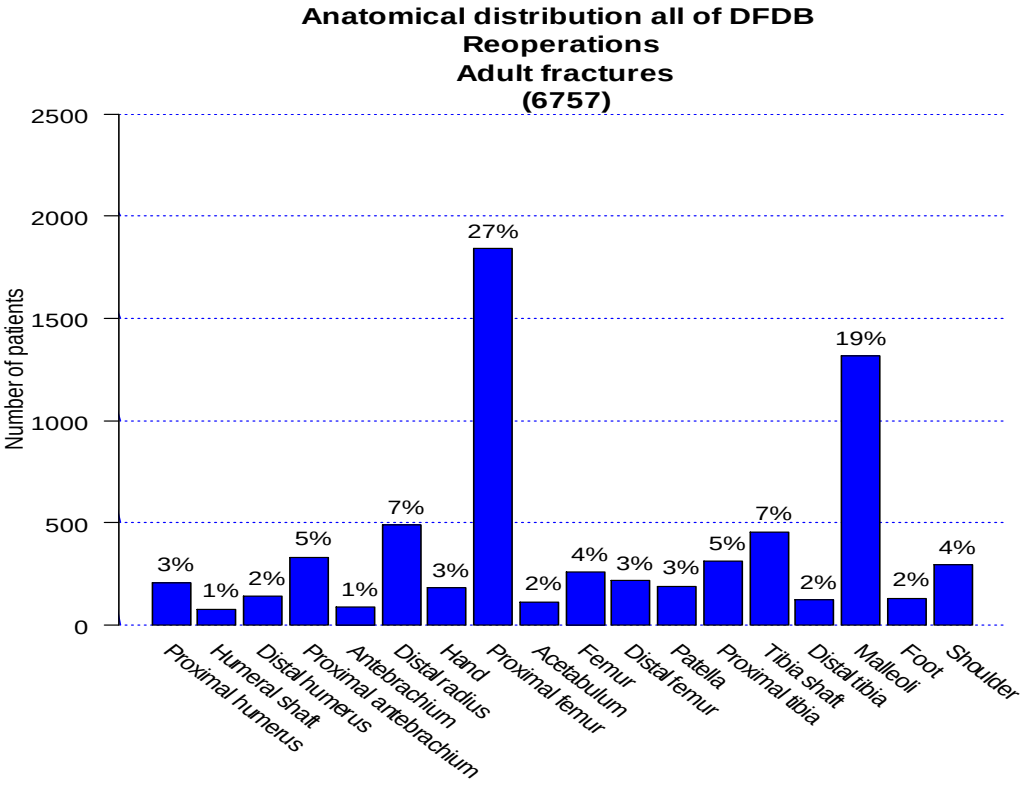


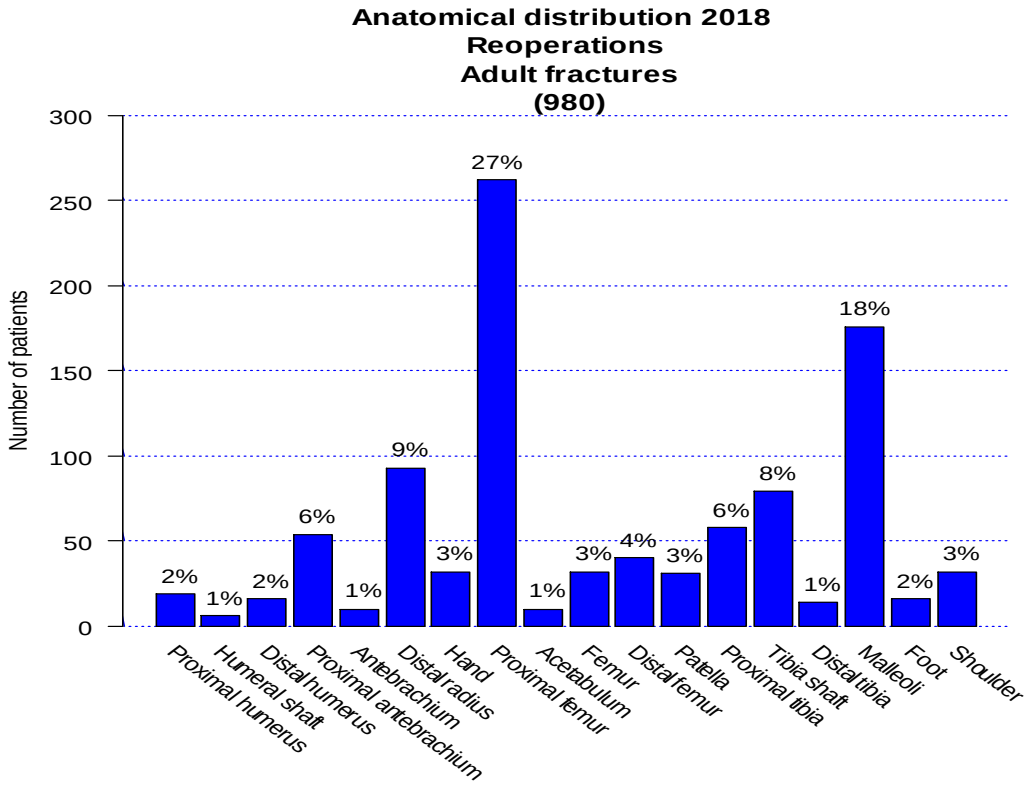


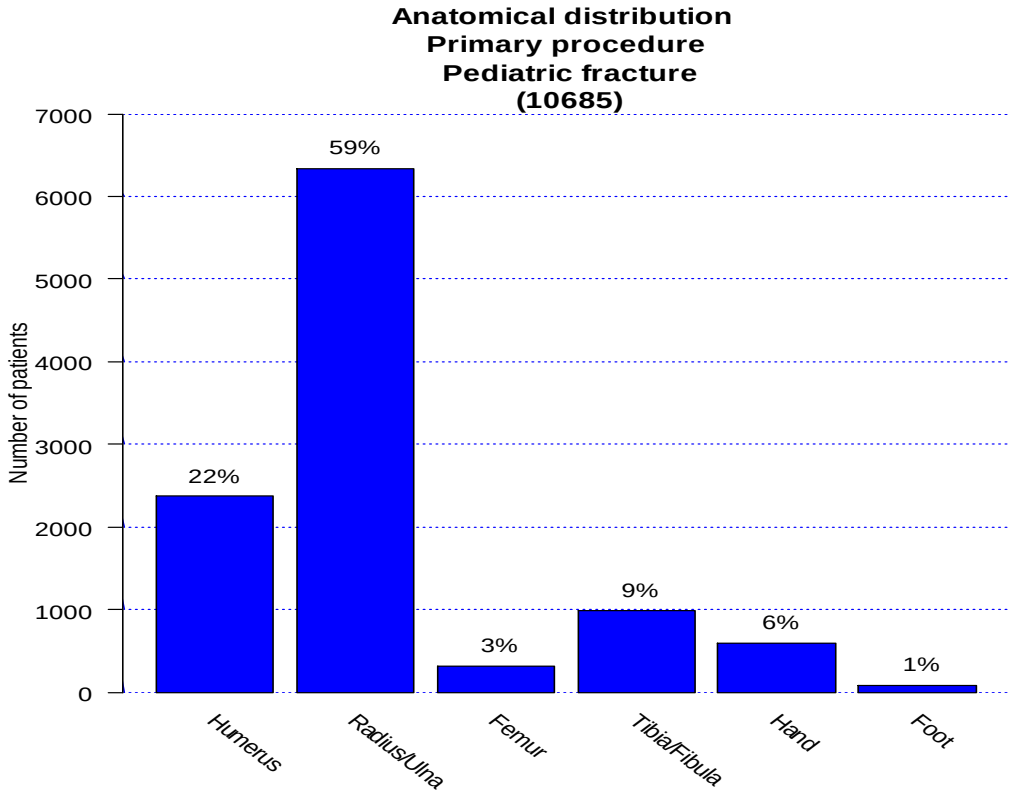

Procedure types by fracture types
(80584)
Primary (73354)
Reoperation (4518)
Hardware removal (2712)
Number of patients
70000
60000
50000
40000
30000
20000
10000
0
90%
6%
4%
96%
3%
1%
Adult
Pediatric

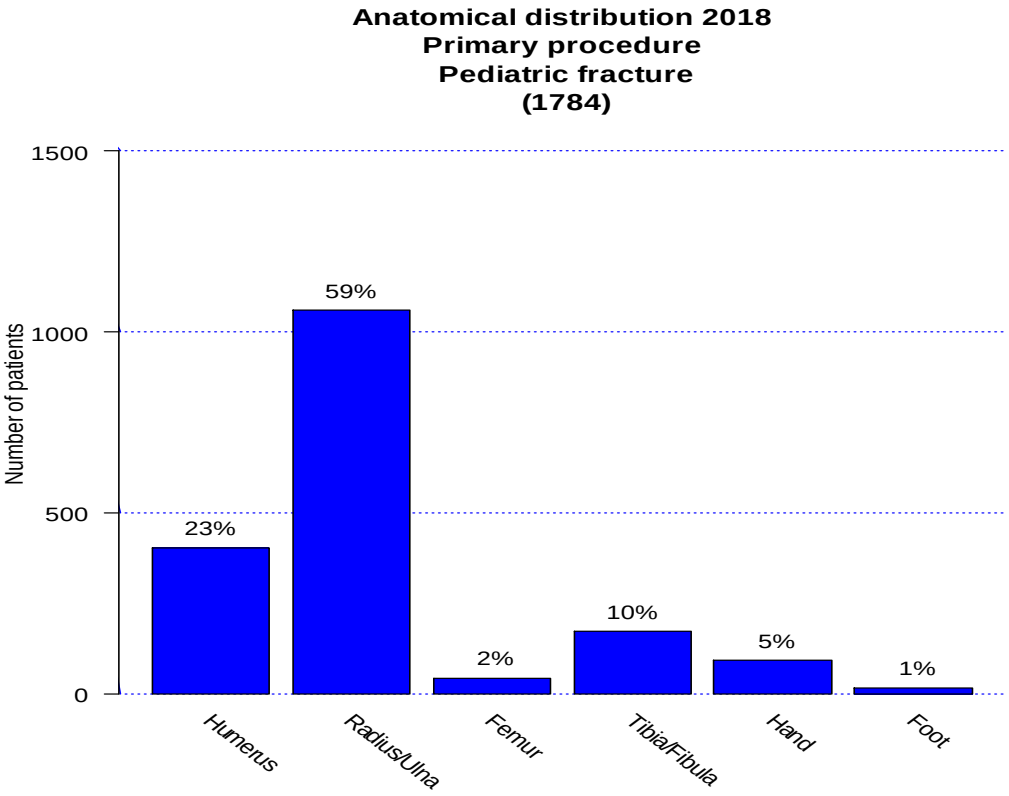

Anatomical distribution all of DFDB
Primary procedure
Adult fractures
(62678)
Number of patients
25000
20000
15000
10000
5000
0
3%
1%
1%
3%
1%
16%
8%
36%
1%
2%
1%
1%
3%
2%
1%
12%
2%
3%
0%
Proximal humerus
Humeral shaft
Distal humerus
Proximal antebrachium
Antebrachium
Distal radius
Hand
Proximal femur
Acetabulum
Femur
Distal femur
Patella
Proximal tibia
Tibia shaft
Distal tibia
Malleoli
Foot
Clavicle
Scapula

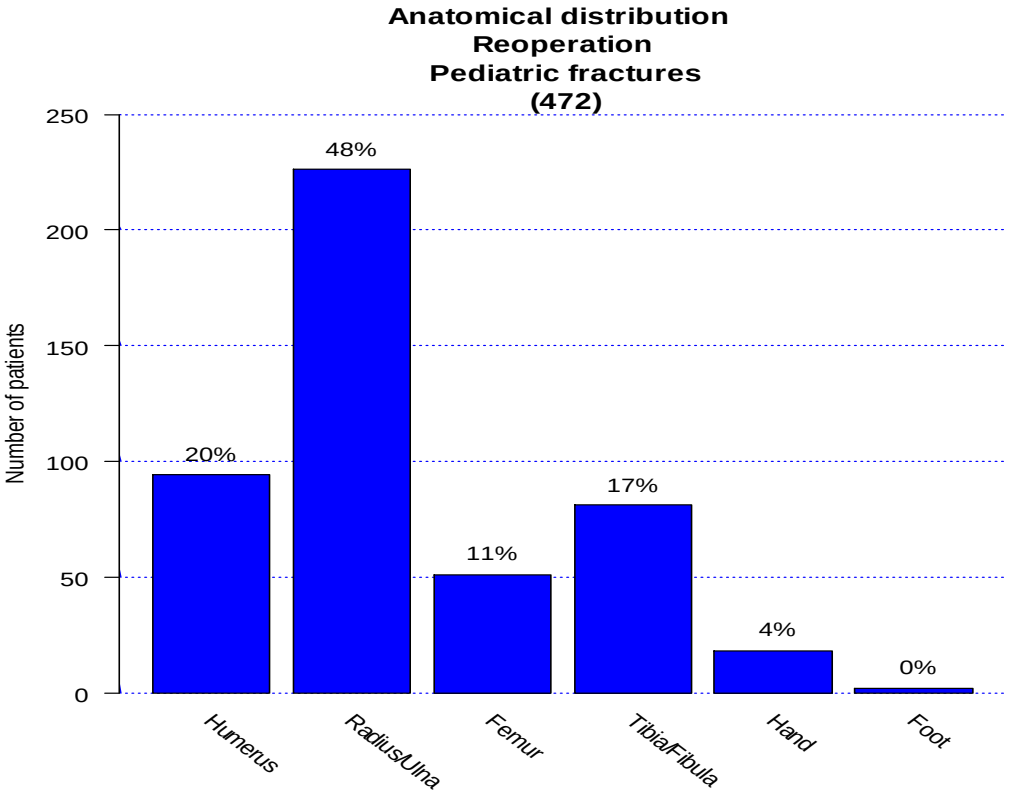

Anatomical distribution 2018
Primary procedure
Adult fractures
(10858)
Number of patients
5000
4000
3000
2000
1000
0
2%
1%
1%
3%
1%
17%
8%
38%
1%
2%
1%
1%
3%
3%
1%
13%
2%
2%
0%
Proximal humerus
Humeral shaft
Distal humerus
Proximal antebrachium
Antebrachium
Distal radius
Hand
Proximal femur
Acetabulum
Femur
Distal femur
Patella
Proximal tibia
Tibia shaft
Distal tibia
Malleoli
Foot
Clavicle
Scapula

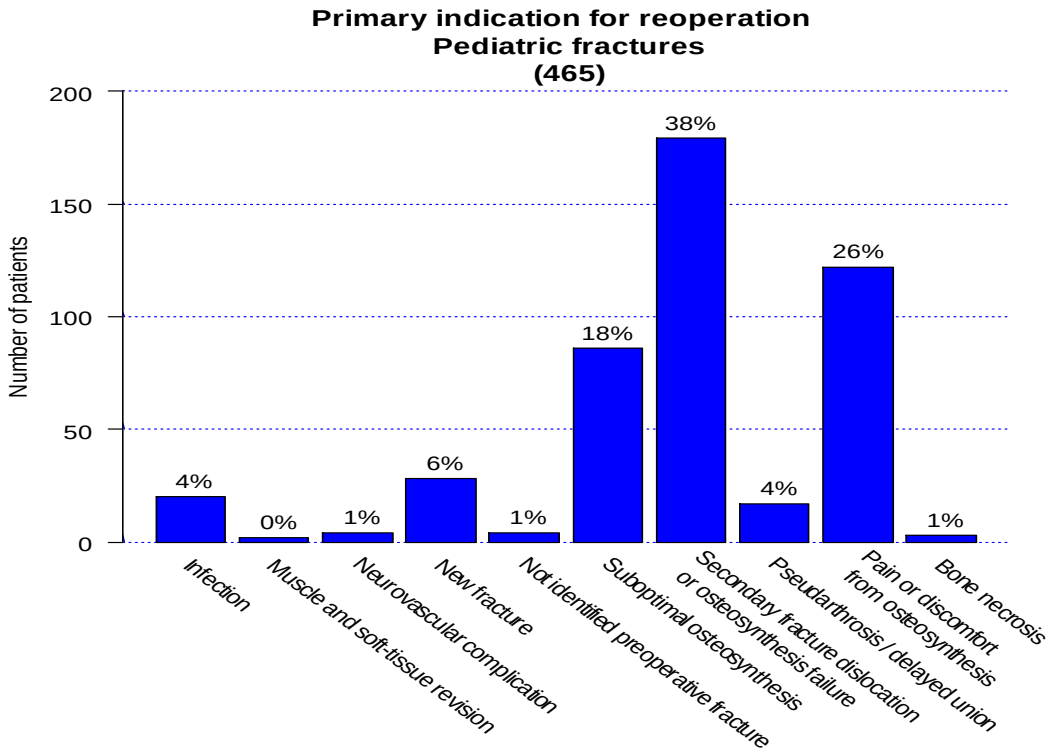

Anatomical distribution all of DFDB
Reoperations
Adult fractures
(6757)
Number of patients
2500
2000
1500
1000
500
0
3%
1%
2%
5%
1%
7%
3%
27%
2%
4%
3%
3%
5%
7%
2%
19%
2%
4%
Proximal humerus
Humeral shaft
Distal humerus
Proximal antebrachium
Antebrachium
Distal radius
Hand
Proximal femur
Acetabulum
Femur
Distal femur
Patella
Proximal tibia
Tibia shaft
Distal tibia
Malleoli
Foot
Shoulder

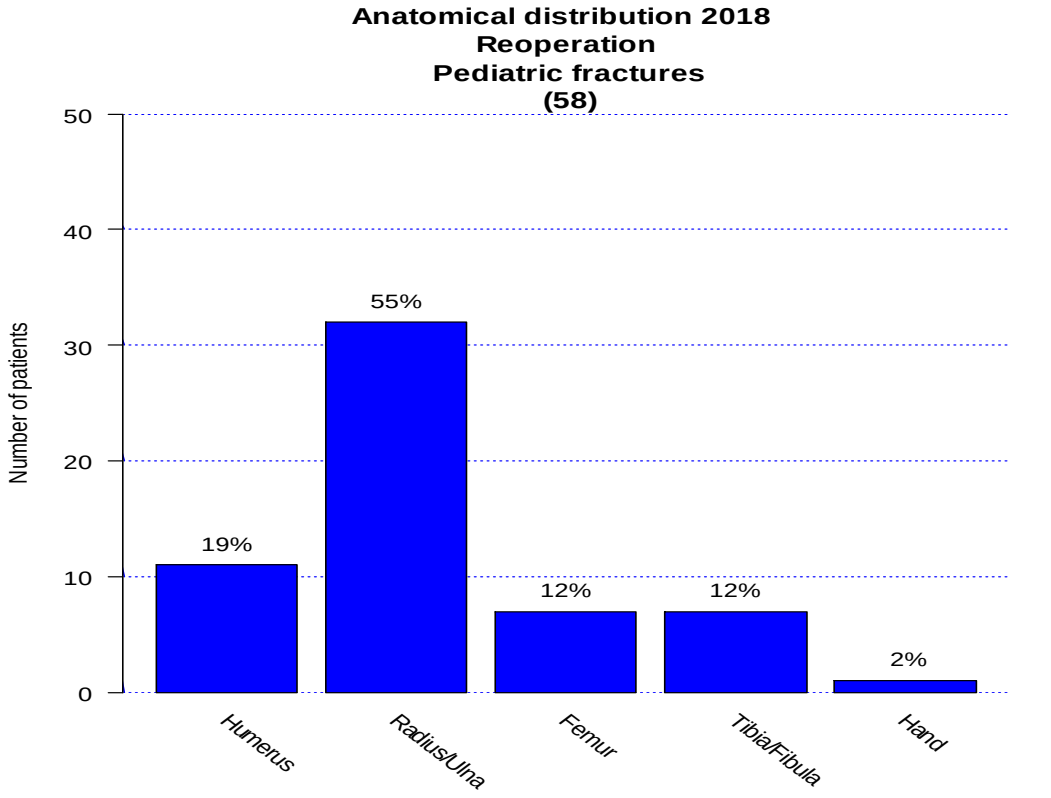

Anatomical distribution 2018
Reoperations
Adult fractures
(980)
Number of patients
300
250
200
150
100
50
0
2%
1%
2%
6%
1%
9%
3%
27%
1%
3%
4%
3%
6%
8%
1%
18%
2%
3%
Proximal humerus
Humeral shaft
Distal humerus
Proximal antebrachium
Antebrachium
Distal radius
Hand
Proximal femur
Acetabulum
Femur
Distal femur
Patella
Proximal tibia
Tibia shaft
Distal tibia
Malleoli
Foot
Shoulder

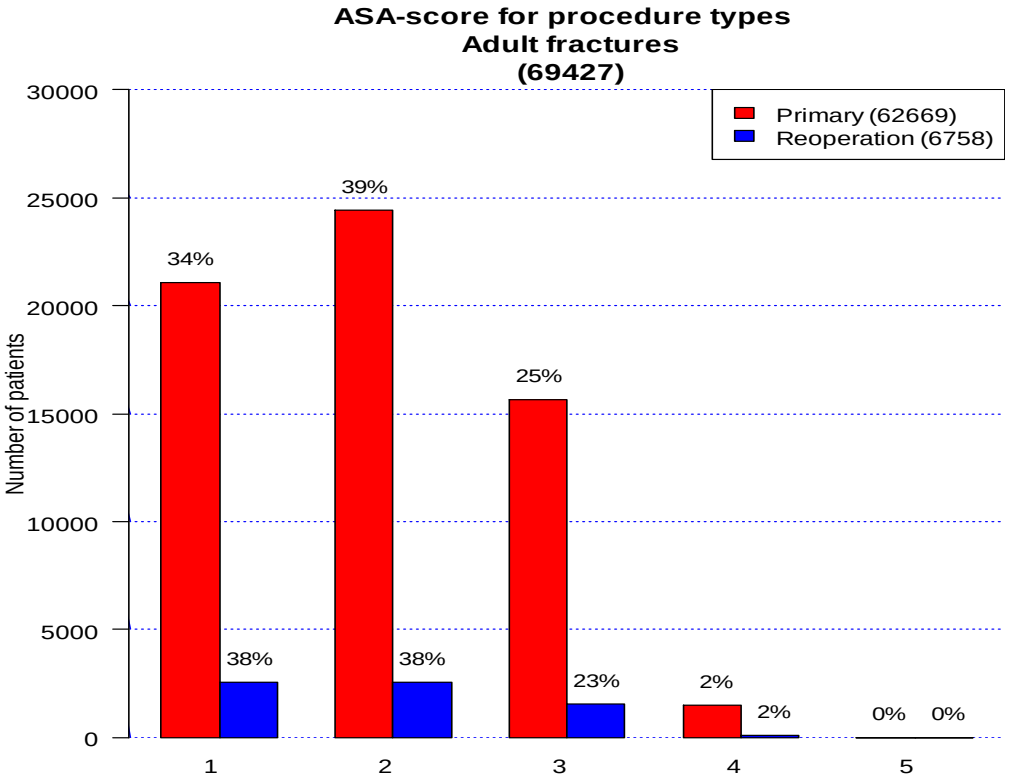

Anatomical distribution
Primary procedure
Pediatric fracture
(10685)
Number of patients
7000
6000
5000
4000
3000
2000
1000
0
22%
59%
3%
9%
6%
1%
Humerus
Radius/Ulna
Femur
Tibia/Fibula
Hand
Foot

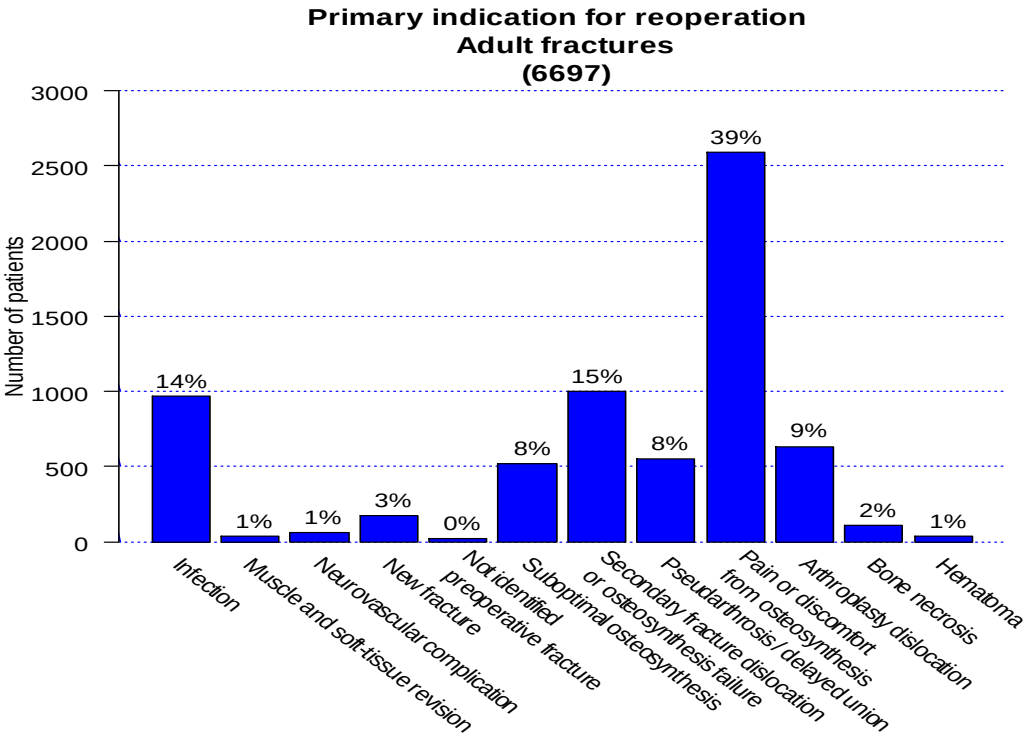

Anatomical distribution 2018
Primary procedure
Pediatric fracture
(1784)
Number of patients
1500
1000
500
0
23%
59%
2%
10%
5%
1%
Humerus
Radius/Ulna
Femur
Tibia/Fibula
Hand
Foot

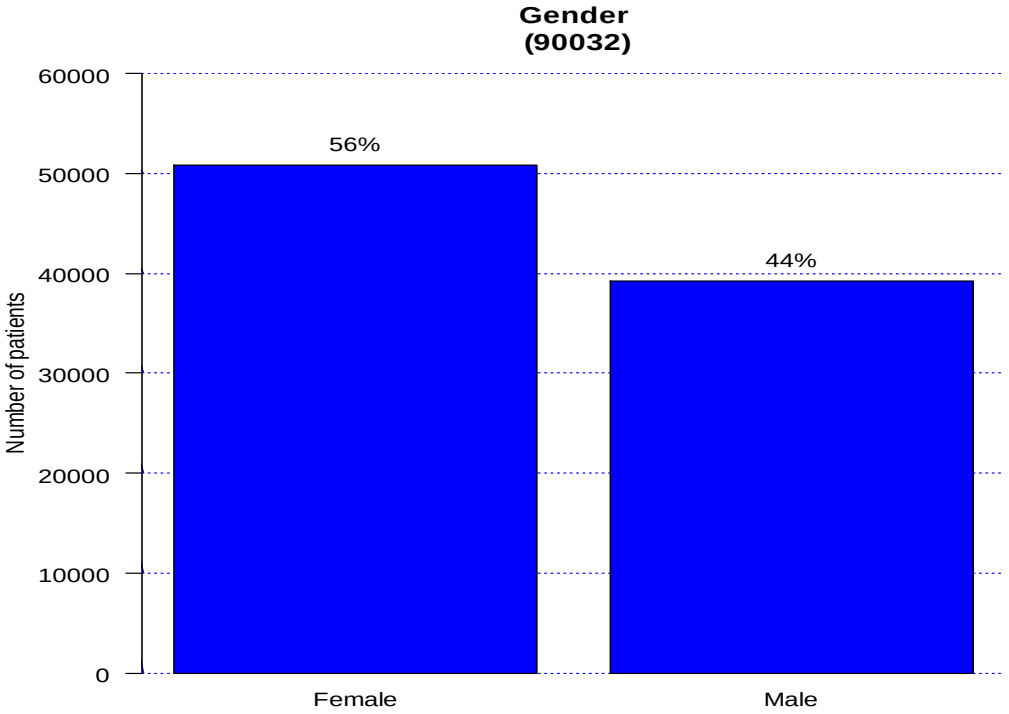

Anatomical distribution
Reoperation
Pediatric fractures
(472)
Number of patients
250
200
150
100
50
0
20%
48%
11%
17%
4%
0%
Humerus
Radius/Ulna
Femur
Tibia/Fibula
Hand
Foot

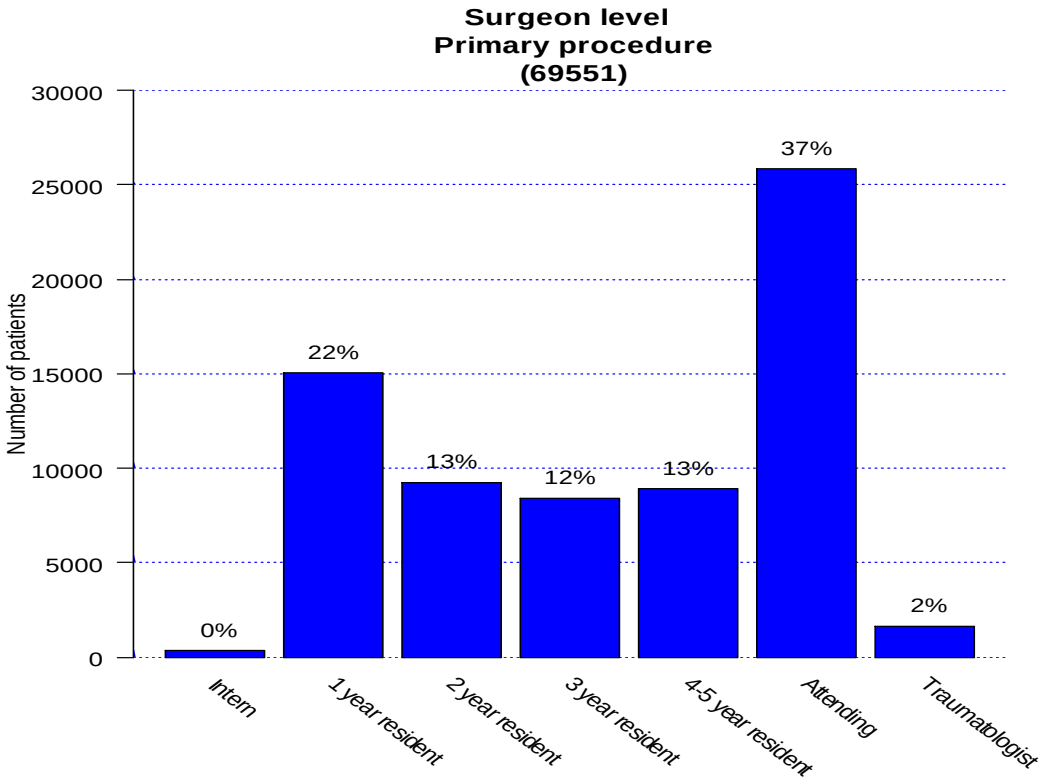

Primary indication for reoperation
Pediatric fractures
(465)
Number of patients
200
150
100
50
0
4%
0%
1%
6%
1%
18%
38%
4%
26%
1%
Infection
Muscle and soft-tissue revision
Neurovascular complication
New fracture
Not identified preoperative fracture
Suboptimal osteosynthesis
or osteosynthesis failure
Secondary fracture dislocation
Pseudarthrosis / delayed union
Pain or discomfort
from osteosynthesis
Bone necrosis

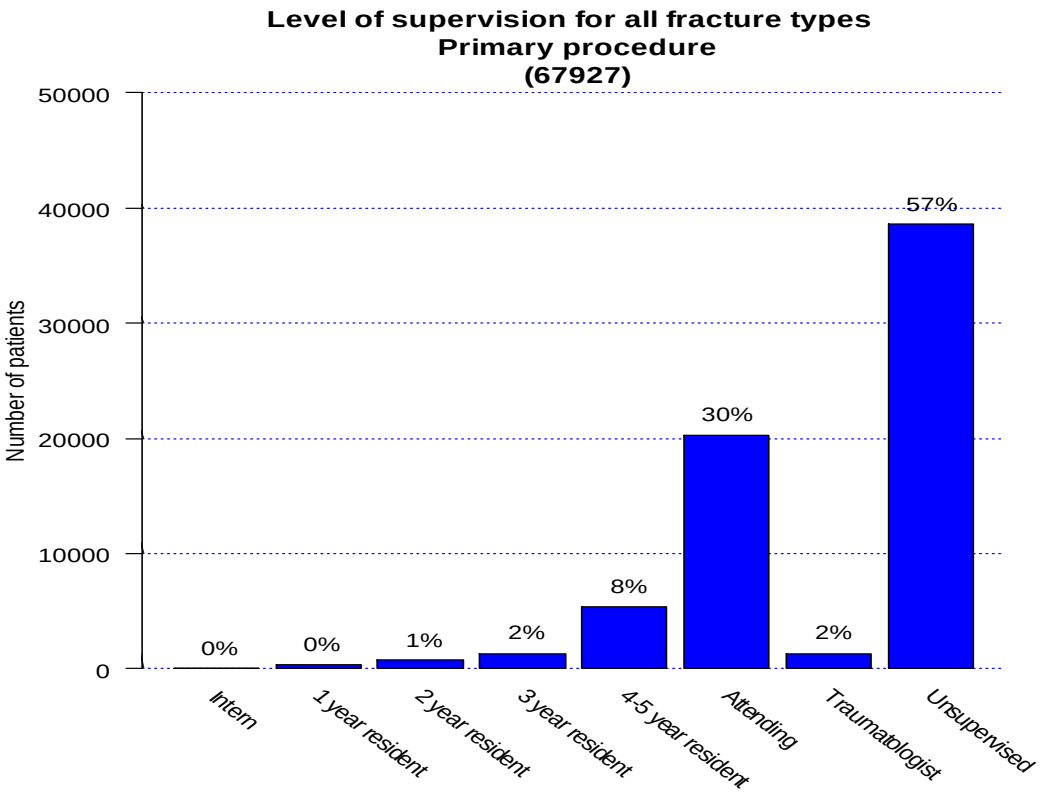

Anatomical distribution 2018
Reoperation
Pediatric fractures
(58)
Number of patients
50
40
30
20
10
0
19%
55%
12%
12%
2%
Humerus
Radius/Ulna
Femur
Tibia/Fibula
Hand

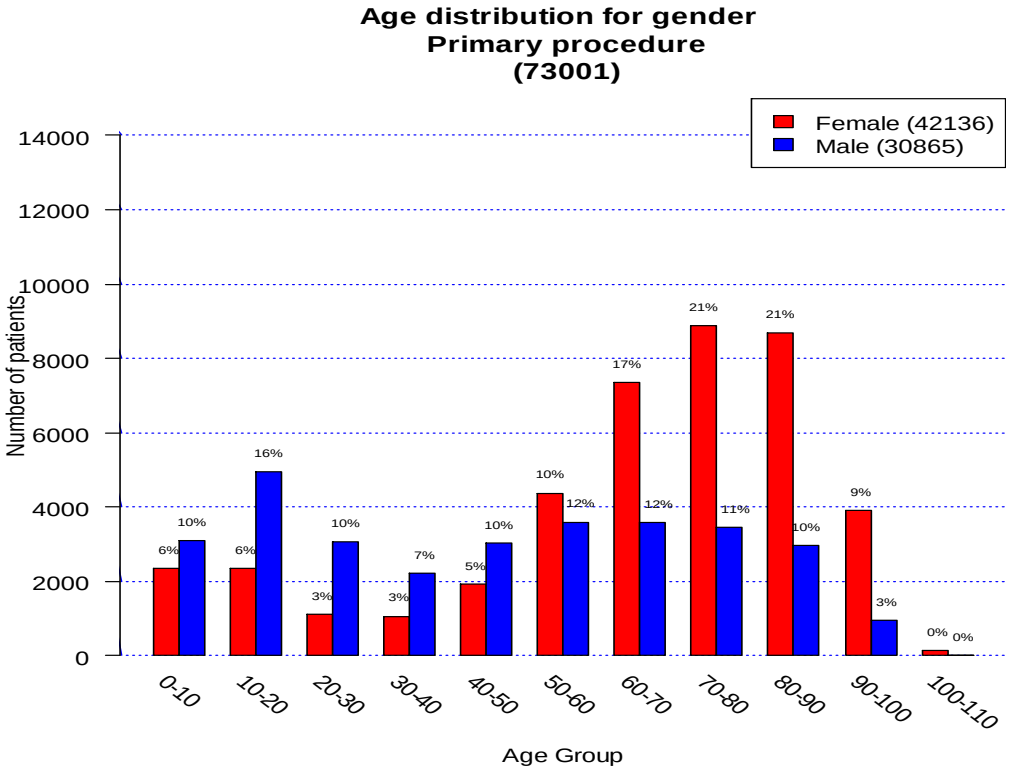

ASA-score for procedure types
Adult fractures
(69427)
Primary (62669)
Reoperation (6758)
Number of patients
30000
25000
20000
15000
10000
5000
0
34%
38%
39%
38%
25%
23%
2%
2%
0%
0%
1
2
3
4
5


Primary indication for reoperation
Adult fractures
(6697)
Number of patients
3000
2500
2000
1500
1000
500
0
14%
1%
1%
3%
0%
8%
15%
8%
39%
9%
2%
1%
Infection
Muscle and soft-tissue revision
Neurovascular complication
New fracture
preoperative fracture
Not identified
Suboptimal osteosynthesis
or osteosynthesis failure
Secondary fracture dislocation
Pseudarthrosis / delayed union
from osteosynthesis
Pain or discomfort
Arthroplasty dislocation
Bone necrosis
Hematoma


Gender
(90032)
Number of patients
60000
50000
40000
30000
20000
10000
0
56%
44%
Female
Male


Surgeon level
Primary procedure
(69551)
Number of patients
30000
25000
20000
15000
10000
5000
0
0%
22%
13%
12%
13%
37%
2%
Intern
1 year resident
2 year resident
3 year resident
4-5 year resident
Attending
Traumatologist

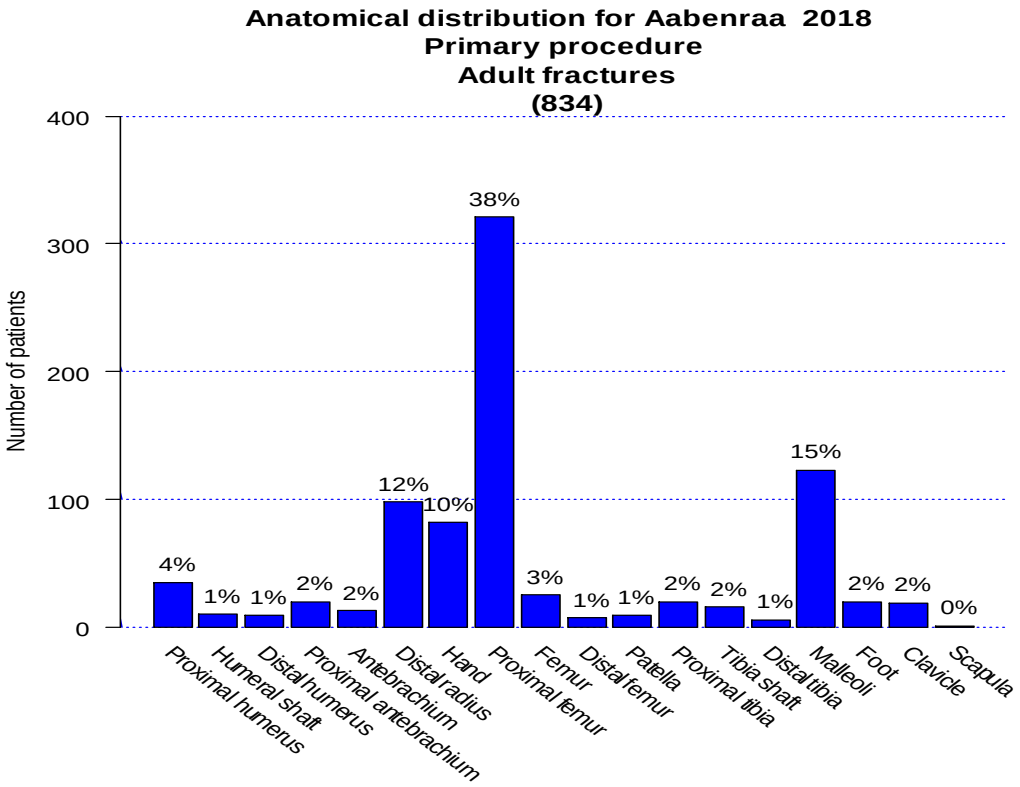

Level of supervision for all fracture types
Primary procedure
(67927)
Number of patients
50000
40000
30000
20000
10000
0
0%
0%
1%
2%
8%
30%
2%
57%
Intern
1 year resident
2 year resident
3 year resident
4-5 year resident
Attending
Traumatologist
Unsupervised


Age distribution for gender
Primary procedure
(73001)
Female (42136)
Male (30865)
Number of patients
14000
12000
10000
8000
6000
4000
2000
0
6%
10%
6%
16%
3%
10%
3%
7%
5%
10%
10%
12%
17%
12%
21%
11%
21%
10%
9%
3%
0%
0%
0-10
10-20
20-30
30-40
40-50
50-60
60-70
70-80
80-90
90-100
100-110
Age Group

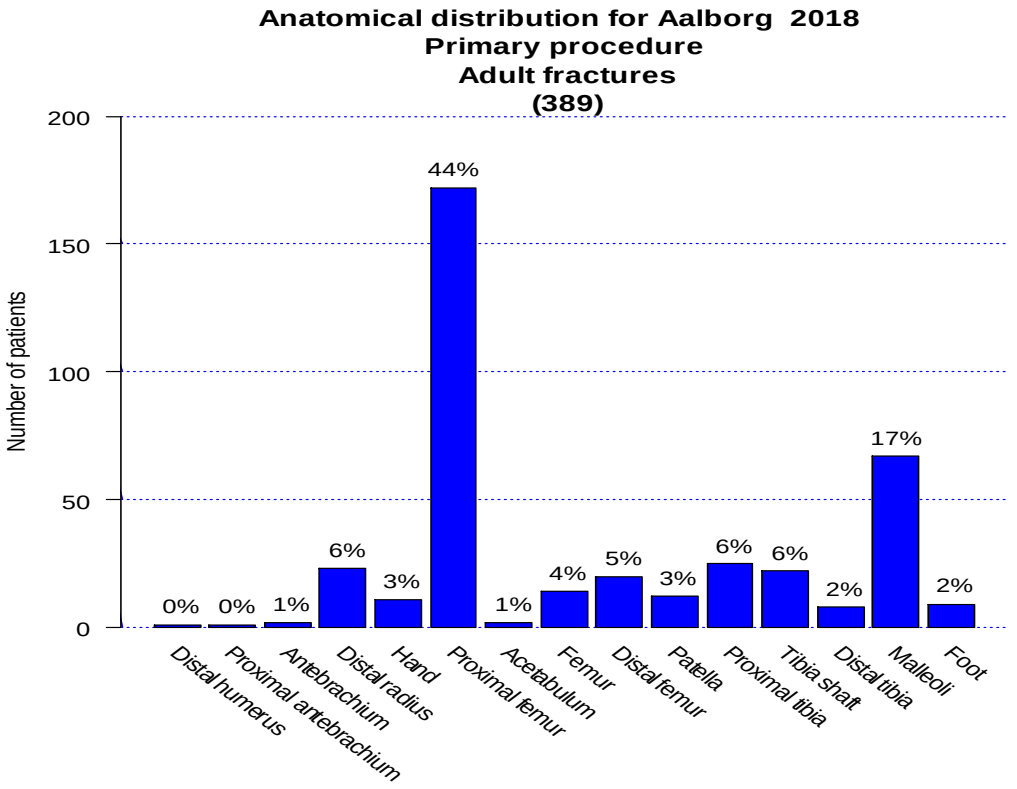
Department specific data

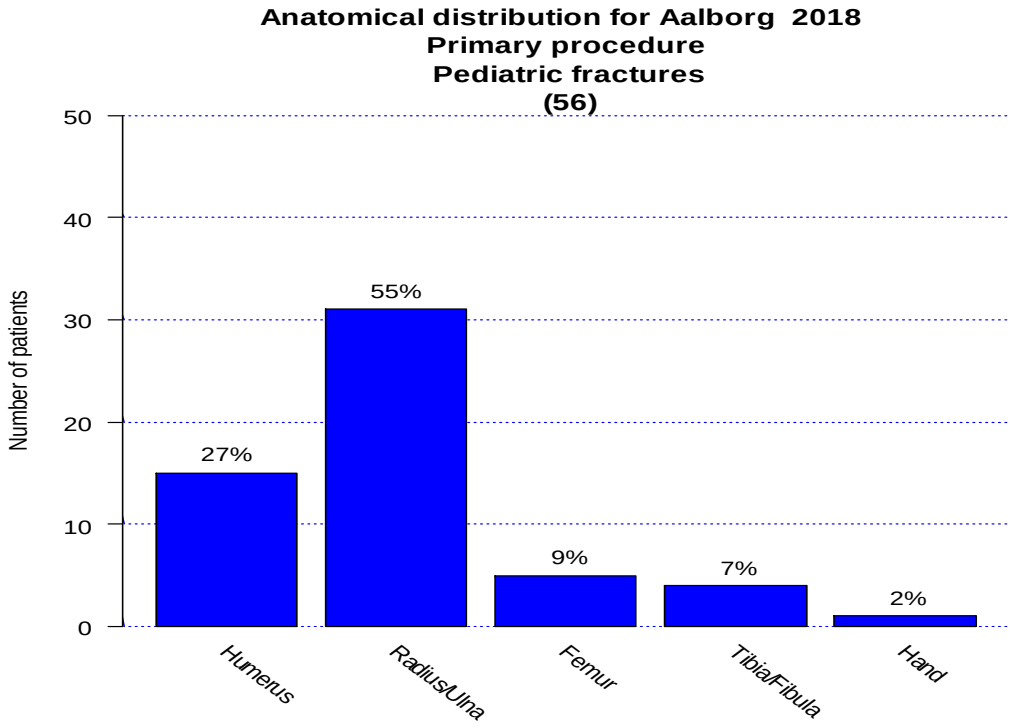
This section provides department specific data for all 21 participating departments. The data covers anatomical distribution for primary procedure for adults and pediatric. Some departments and graphs are left out as a consequence of very few reported operations.

Aabenraa

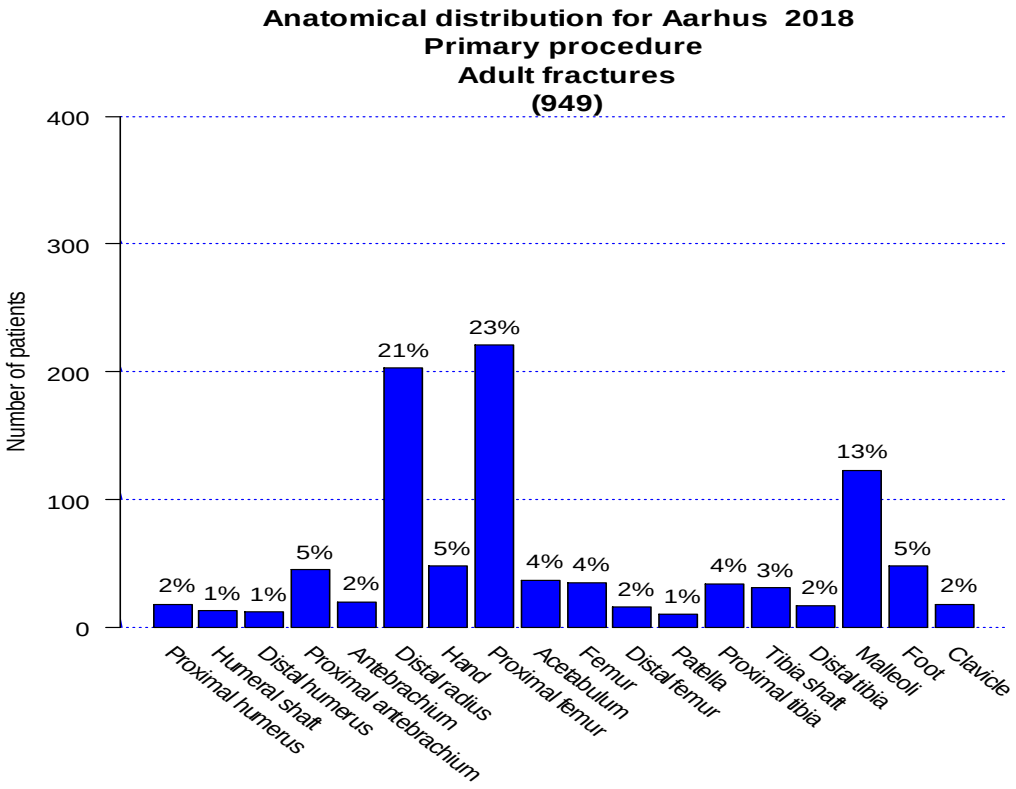

Anatomical distribution for Aabenraa 2018
Primary procedure
Adult fractures
(834)
Number of patients
400
300
200
100
0
4%
1%
1%
2%
2%
12%
10%
38%
3%
1%
1%
2%
2%
1%
15%
2%
2%
0%
Proximal humerus
Humeral shaft
Distal humerus
Proximal antebrachium
Antebrachium
Distal radius
Hand
Proximal femur
Femur
Distal femur
Patella
Proximal tibia
Tibia shaft
Distal tibia
Malleoli
Foot
Clavicle
Scapula

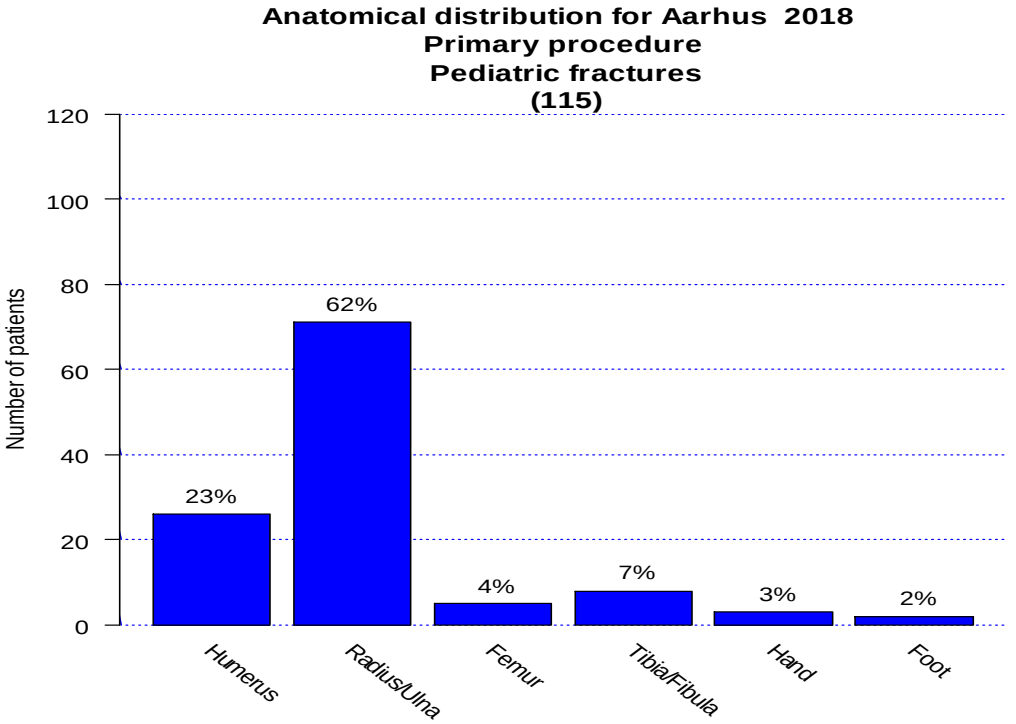
Aalborg


Anatomical distribution for Aalborg 2018
Primary procedure
Adult fractures
(389)
Number of patients
200
150
100
50
0
0%
0%
1%
6%
3%
44%
1%
4%
5%
3%
6%
6%
2%
17%
2%
Distal humerus
Proximal antebrachium
Antebrachium
Distal radius
Hand
Proximal femur
Acetabulum
Femur
Distal femur
Patella
Proximal tibia
Tibia shaft
Distal tibia
Malleoli
Foot

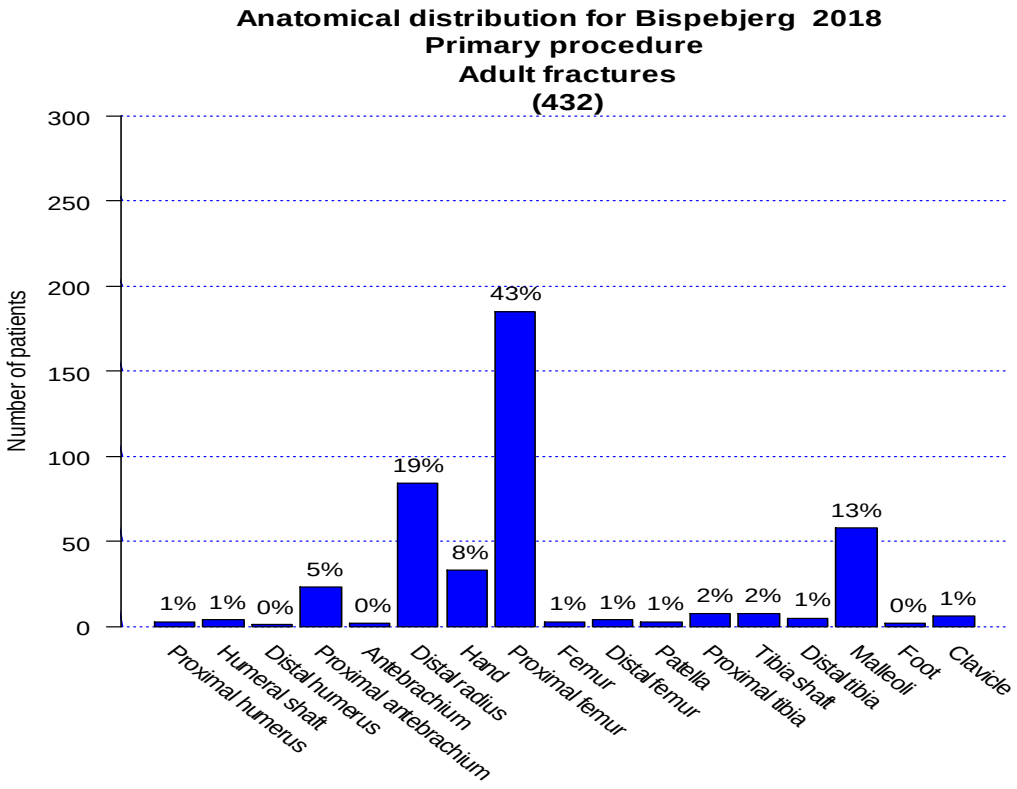

Anatomical distribution for Aalborg 2018
Primary procedure
Pediatric fractures
(56)
Number of patients
50
40
30
20
10
0
27%
55%
9%
7%
2%
Humerus
Radius/Ulna
Femur
Tibia/Fibula
Hand

Aarhus

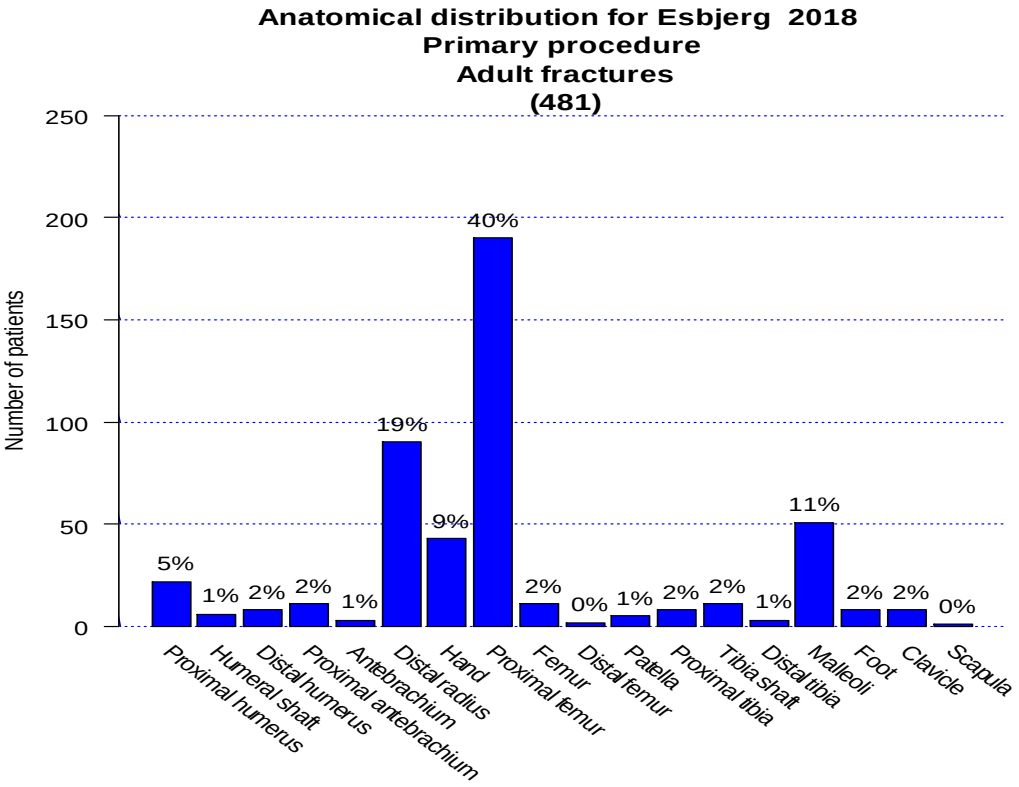

Anatomical distribution for Aarhus 2018
Primary procedure
Adult fractures
(949)
Number of patients
400
300
200
100
0
2%
1%
1%
5%
2%
21%
5%
23%
4%
4%
2%
1%
4%
3%
2%
13%
5%
2%
Proximal humerus
Humeral shaft
Distal humerus
Proximal antebrachium
Antebrachium
Distal radius
Hand
Proximal femur
Acetabulum
Femur
Distal femur
Patella
Proximal tibia
Tibia shaft
Distal tibia
Malleoli
Foot
Clavicle

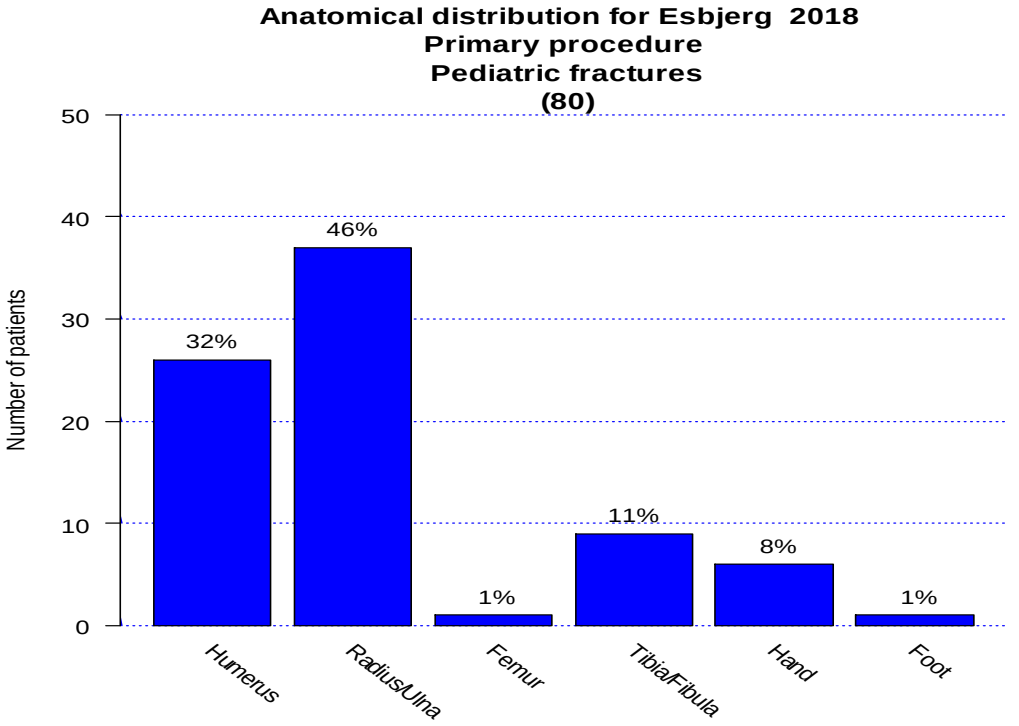

Anatomical distribution for Aarhus 2018
Primary procedure
Pediatric fractures
(115)
Number of patients
120
100
80
60
40
20
0
23%
62%
4%
7%
3%
2%
Humerus
Radius/Ulna
Femur
Tibia/Fibula
Hand
Foot

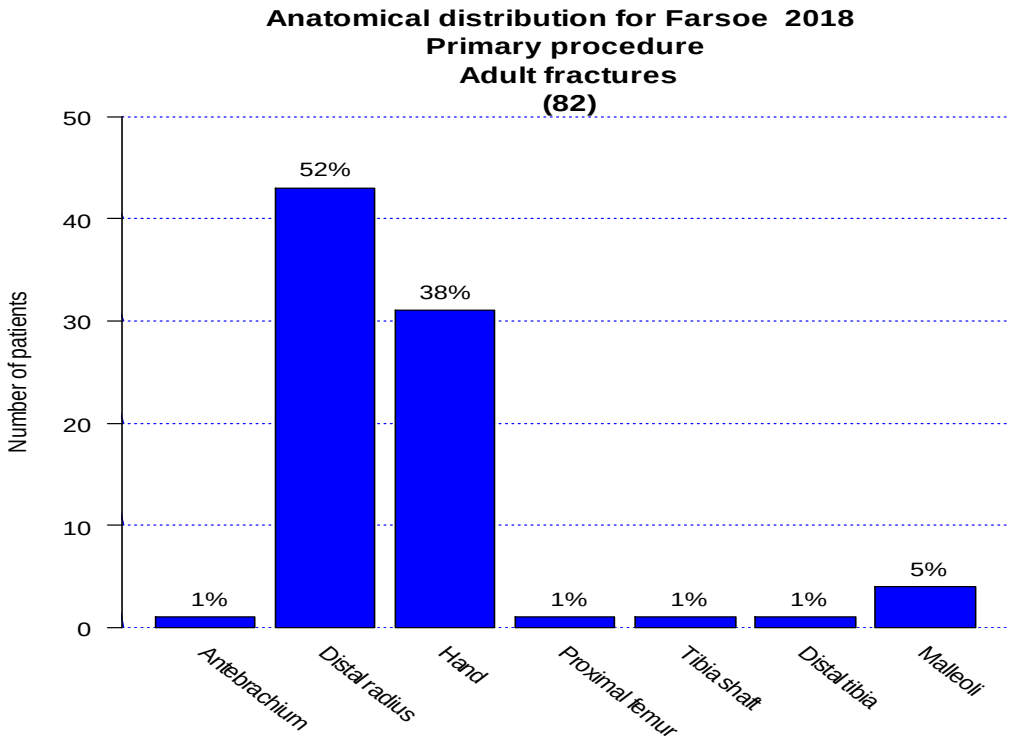
Bispebjerg


Anatomical distribution for Bispebjerg 2018
Primary procedure
Adult fractures
(432)
Number of patients
300
250
200
150
100
50
0
1%
1%
0%
5%
0%
19%
8%
43%
1%
1%
1%
2%
2%
1%
13%
0%
1%
Proximal humerus
Humeral shaft
Distal humerus
Proximal antebrachium
Antebrachium
Distal radius
Hand
Proximal femur
Femur
Distal femur
Patella
Proximal tibia
Tibia shaft
Distal tibia
Malleoli
Foot
Clavicle

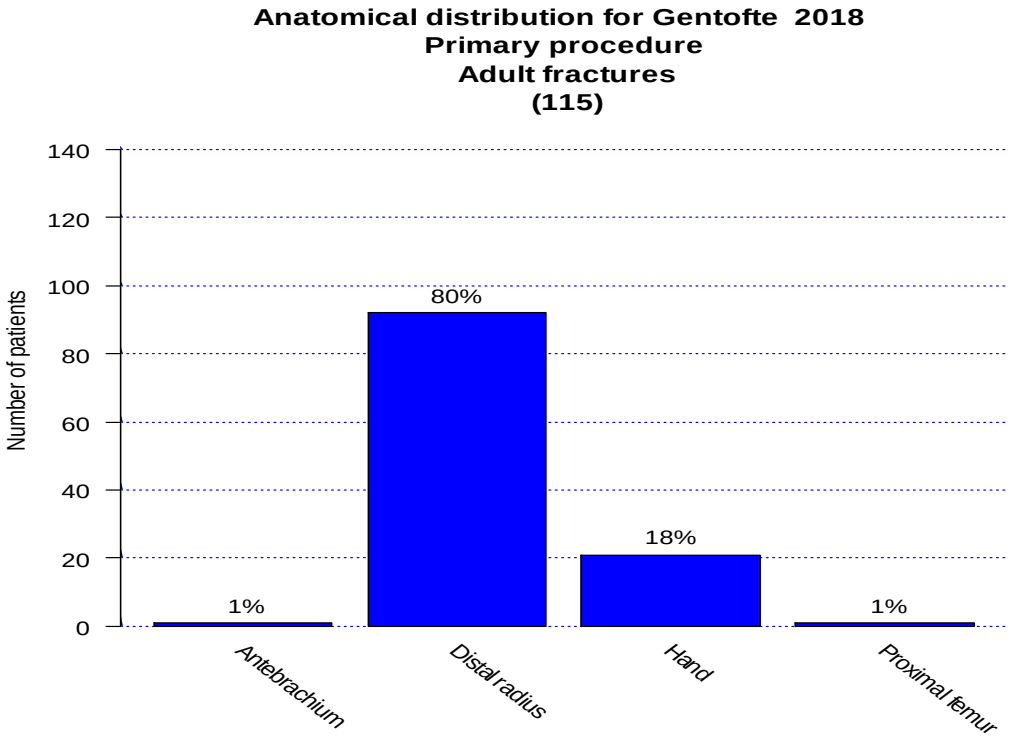
Esbjerg

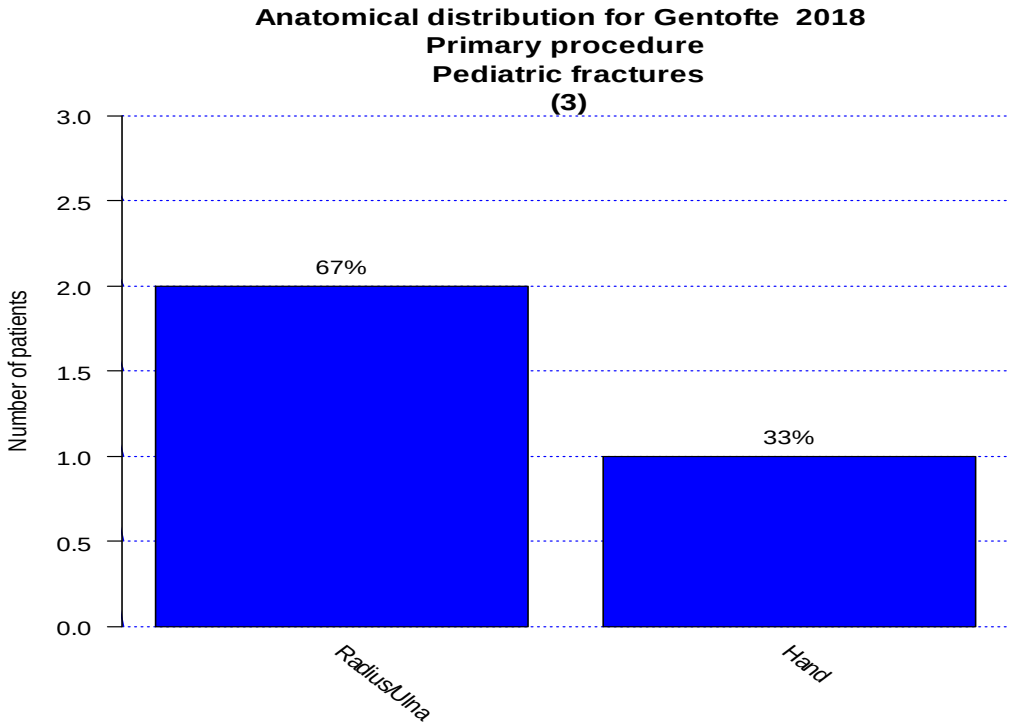

Anatomical distribution for Esbjerg 2018
Primary procedure
Adult fractures
(481)
Number of patients
250
200
150
100
50
0
5%
1%
2%
2%
1%
19%
9%
40%
2%
0%
1%
2%
2%
1%
11%
2%
2%
0%
Proximal humerus
Humeral shaft
Distal humerus
Proximal antebrachium
Antebrachium
Distal radius
Hand
Proximal femur
Femur
Distal femur
Patella
Proximal tibia
Tibia shaft
Distal tibia
Malleoli
Foot
Clavicle
Scapula

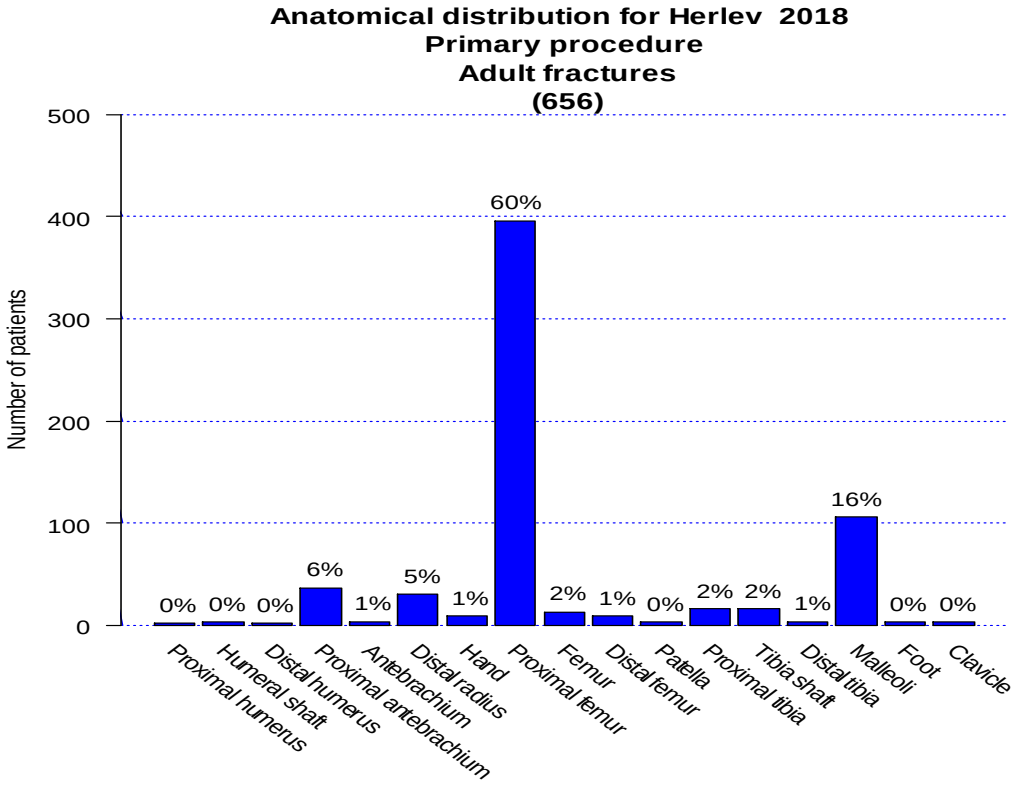

Anatomical distribution for Esbjerg 2018
Primary procedure
Pediatric fractures
(80)
Number of patients
50
40
30
20
10
0
32%
46%
1%
11%
8%
1%
Humerus
Radius/Ulna
Femur
Tibia/Fibula
Hand
Foot

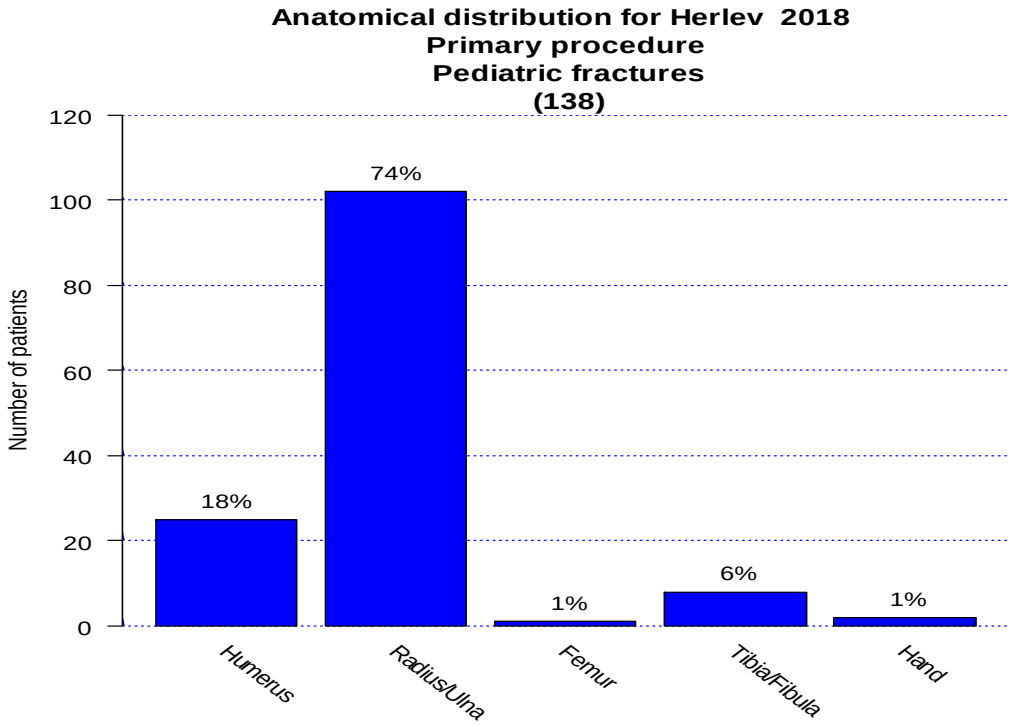

Anatomical distribution for Farsoe 2018
Primary procedure
Adult fractures
(82)
Number of patients
50
40
30
20
10
0
52%
38%
1%
1%
1%
1%
5%
Antebrachium
Distal radius
Hand
Proximal femur
Tibia shaft
Distal tibia
Malleoli

Gentofte

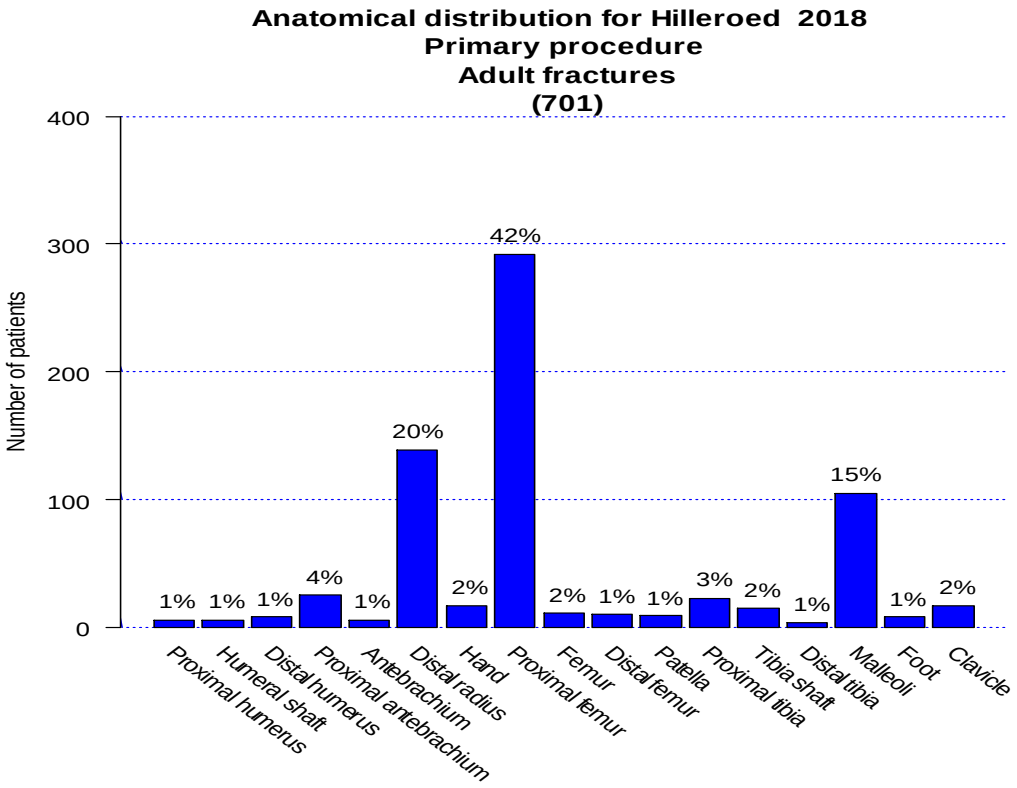

Anatomical distribution for Gentofte 2018
Primary procedure
Adult fractures
(115)
Number of patients
140
120
100
80
60
40
20
0
80%
18%
1%
1%
Antebrachium
Distal radius
Hand
Proximal femur

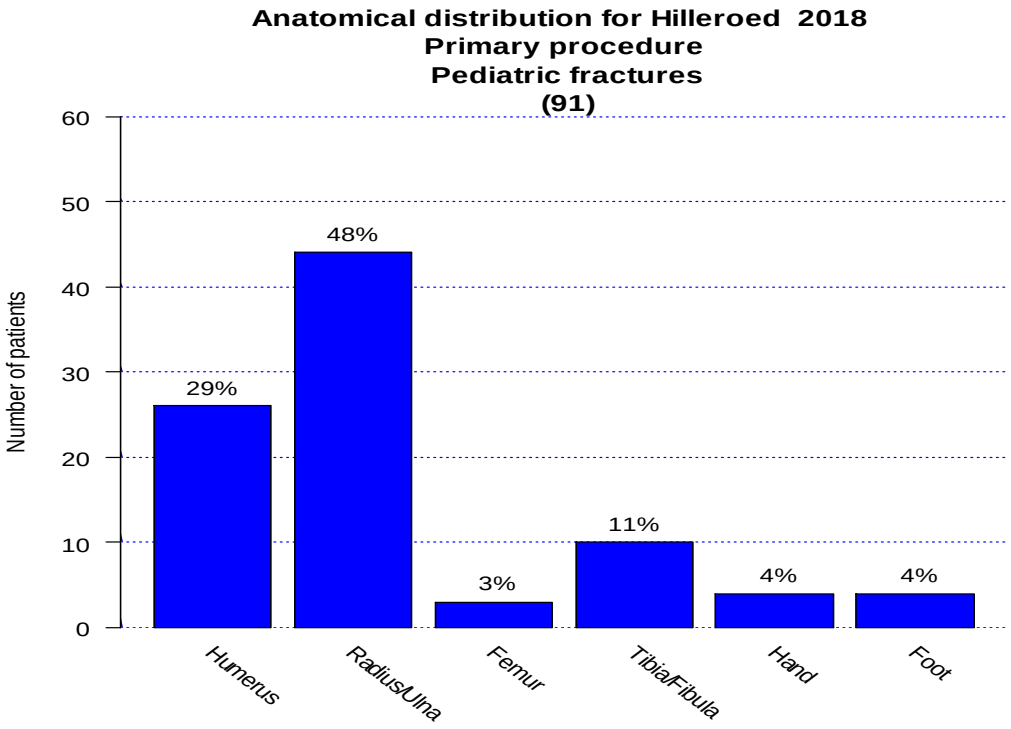

Anatomical distribution for Gentofte 2018
Primary procedure
Pediatric fractures
(3)
Number of patients
3.0
2.5
2.0
1.5
1.0
0.5
0.0
67%
33%
Radius/Ulna
Hand


Anatomical distribution for Herlev 2018
Primary procedure
Adult fractures
(656)
Number of patients
500
400
300
200
100
0
0%
0%
0%
6%
1%
5%
1%
60%
2%
1%
0%
2%
2%
1%
16%
0%
0%
Proximal humerus
Humeral shaft
Distal humerus
Proximal antebrachium
Antebrachium
Distal radius
Hand
Proximal femur
Femur
Distal femur
Patella
Proximal tibia
Tibia shaft
Distal tibia
Malleoli
Foot
Clavicle

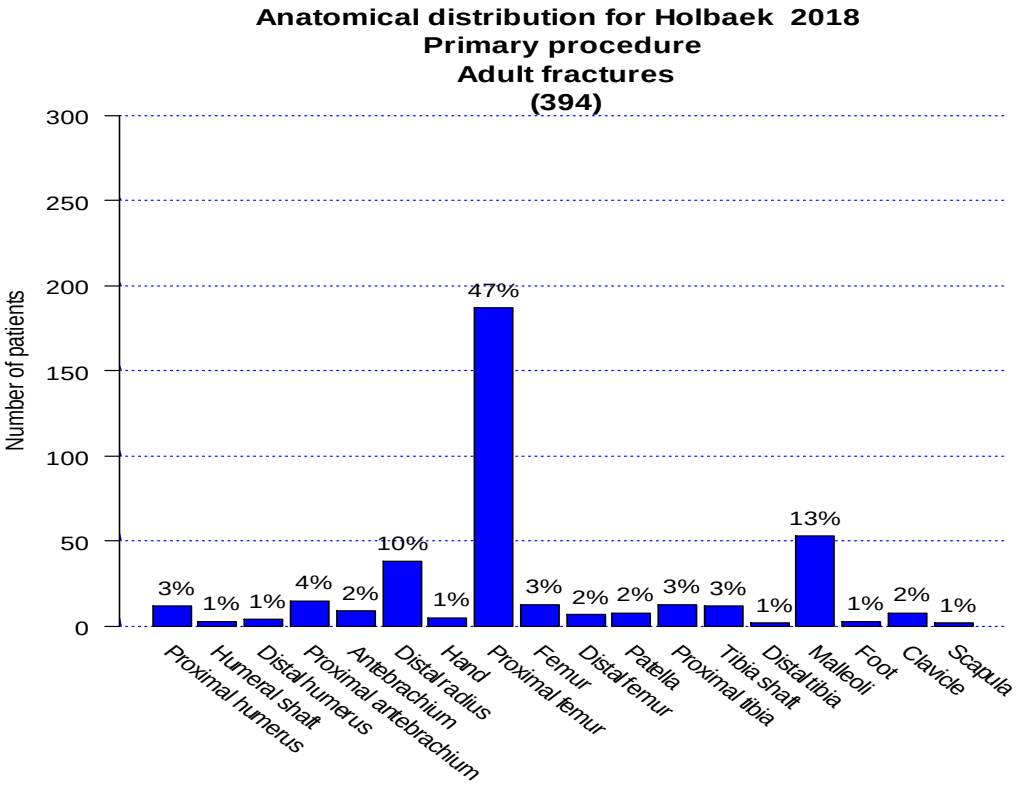

Anatomical distribution for Herlev 2018
Primary procedure
Pediatric fractures
(138)
Number of patients
120
100
80
60
40
20
0
18%
74%
1%
6%
1%
Humerus
Radius/Ulna
Femur
Tibia/Fibula
Hand

Hillerød

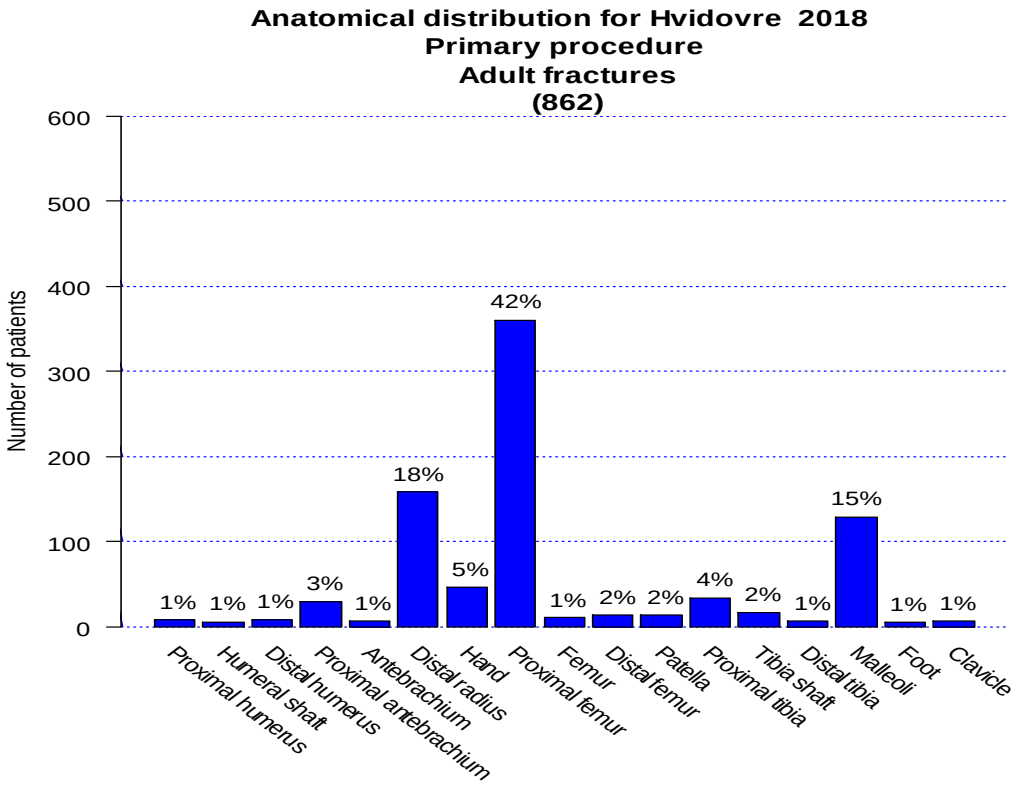

Anatomical distribution for Hilleroed 2018
Primary procedure
Adult fractures
(701)
Number of patients
400
300
200
100
0
1%
1%
1%
4%
1%
20%
2%
42%
2%
1%
1%
3%
2%
1%
15%
1%
2%
Proximal humerus
Humeral shaft
Distal humerus
Proximal antebrachium
Antebrachium
Distal radius
Hand
Proximal femur
Femur
Distal femur
Patella
Proximal tibia
Tibia shaft
Distal tibia
Malleoli
Foot
Clavicle

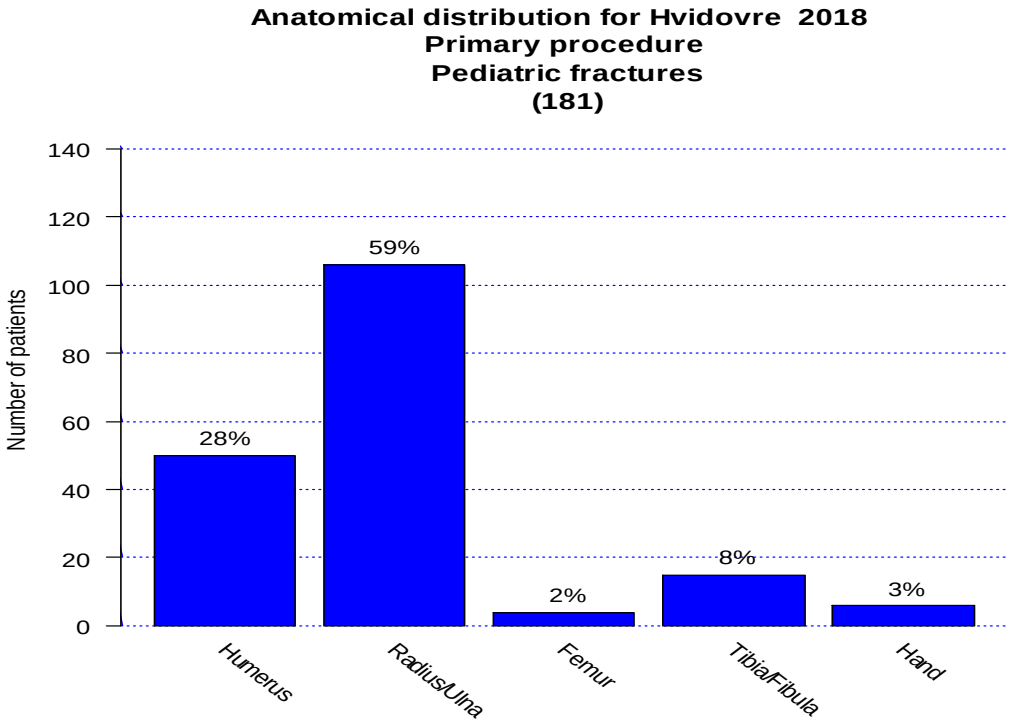

Anatomical distribution for Hilleroed 2018
Primary procedure
Pediatric fractures
(91)
Number of patients
60
50
40
30
20
10
0
29%
48%
3%
11%
4%
4%
Humerus
Radius/Ulna
Femur
Tibia/Fibula
Hand
Foot

Holbæk

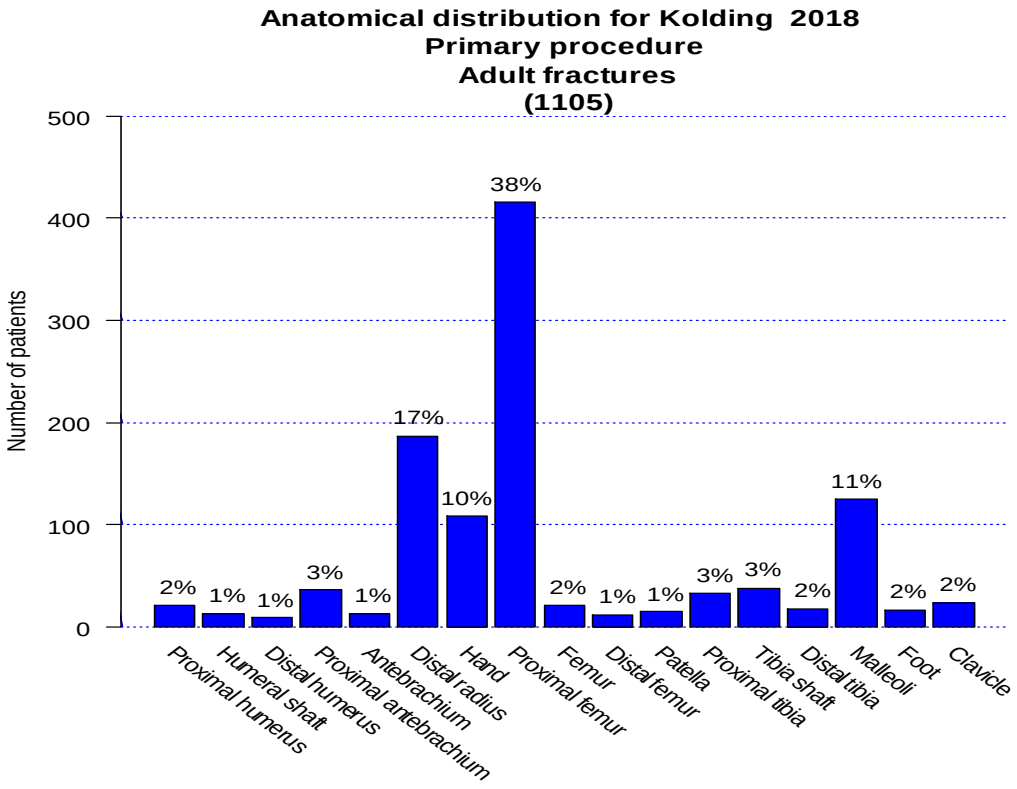

Anatomical distribution for Holbaek 2018
Primary procedure
Adult fractures
(394)
Number of patients
300
250
200
150
100
50
0
3%
1%
1%
4%
2%
10%
1%
47%
3%
2%
2%
3%
3%
1%
13%
1%
2%
1%
Proximal humerus
Humeral shaft
Distal humerus
Proximal antebrachium
Antebrachium
Distal radius
Hand
Proximal femur
Femur
Distal femur
Patella
Proximal tibia
Tibia shaft
Distal tibia
Malleoli
Foot
Clavicle
Scapula

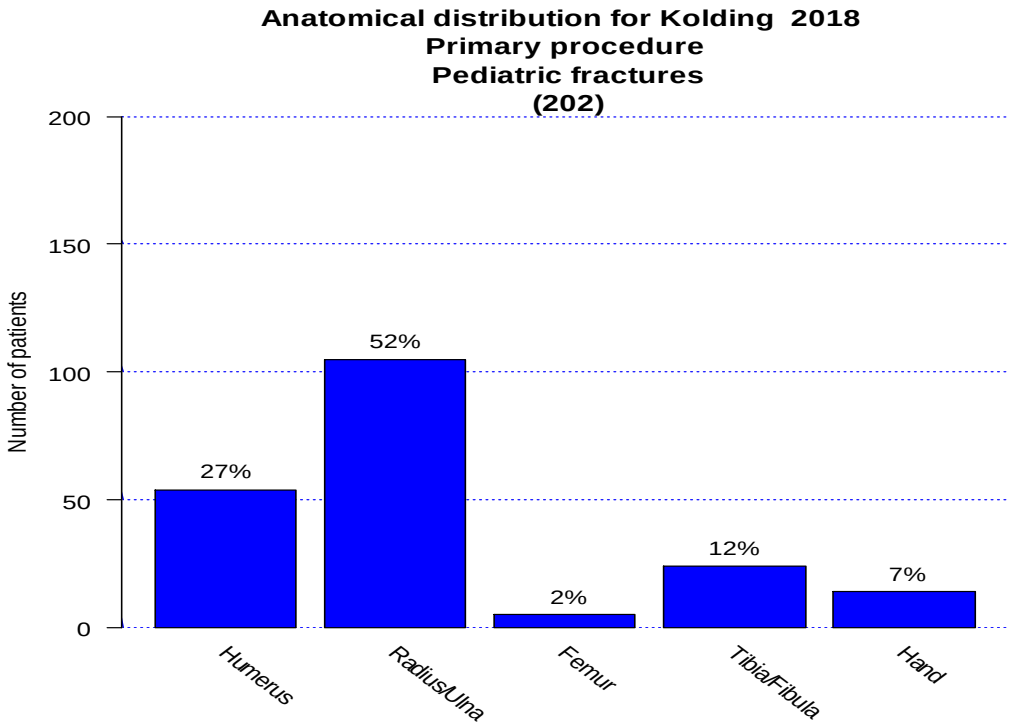
Hvidovre


Anatomical distribution for Hvidovre 2018
Primary procedure
Adult fractures
(862)
Number of patients
600
500
400
300
200
100
0
1%
1%
1%
3%
1%
18%
5%
42%
1%
2%
2%
4%
2%
1%
15%
1%
1%
Proximal humerus
Humeral shaft
Distal humerus
Proximal antebrachium
Antebrachium
Distal radius
Hand
Proximal femur
Femur
Distal femur
Patella
Proximal tibia
Tibia shaft
Distal tibia
Malleoli
Foot
Clavicle

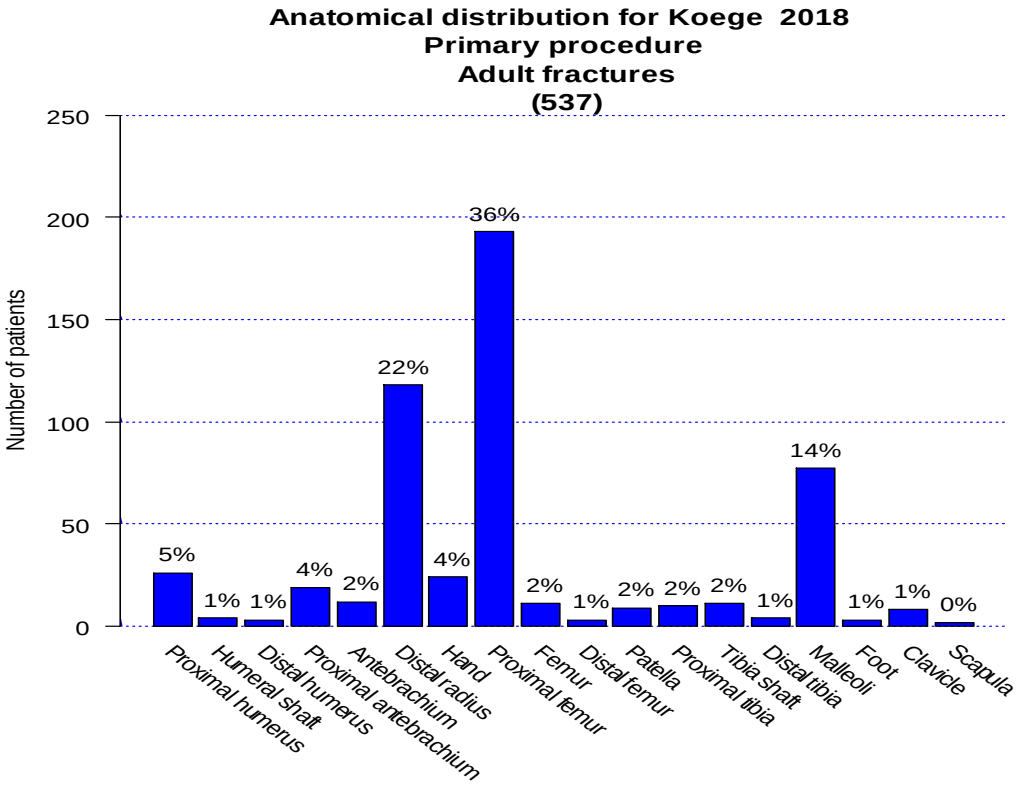

Anatomical distribution for Hvidovre 2018
Primary procedure
Pediatric fractures
(181)
Number of patients
140
120
100
80
60
40
20
0
28%
59%
2%
8%
3%
Humerus
Radius/Ulna
Femur
Tibia/Fibula
Hand

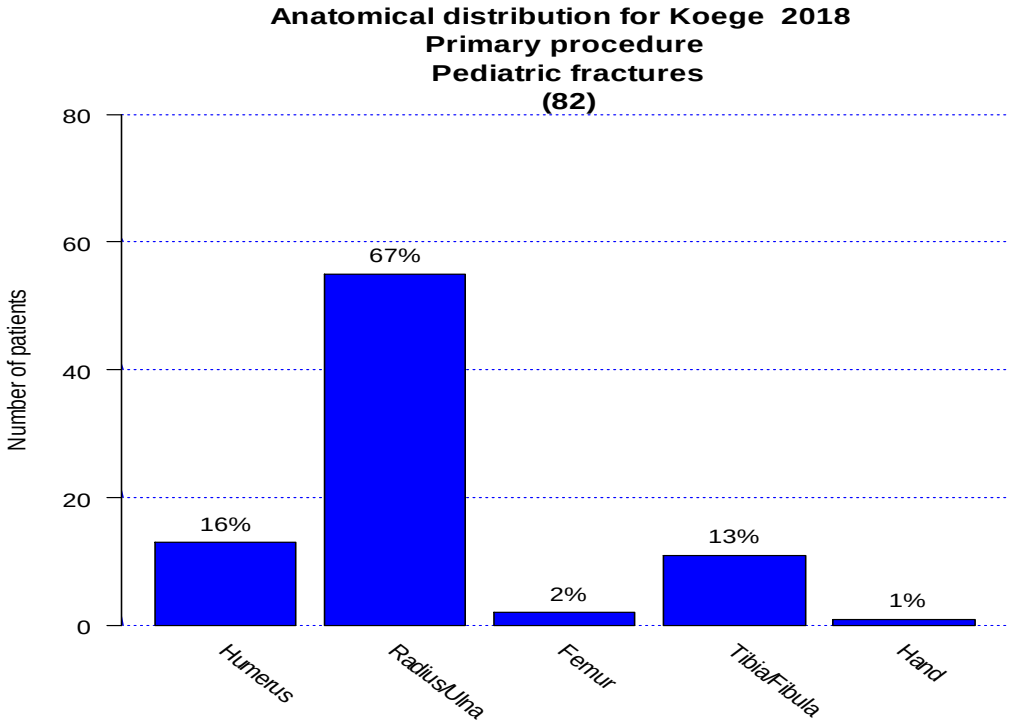
Kolding

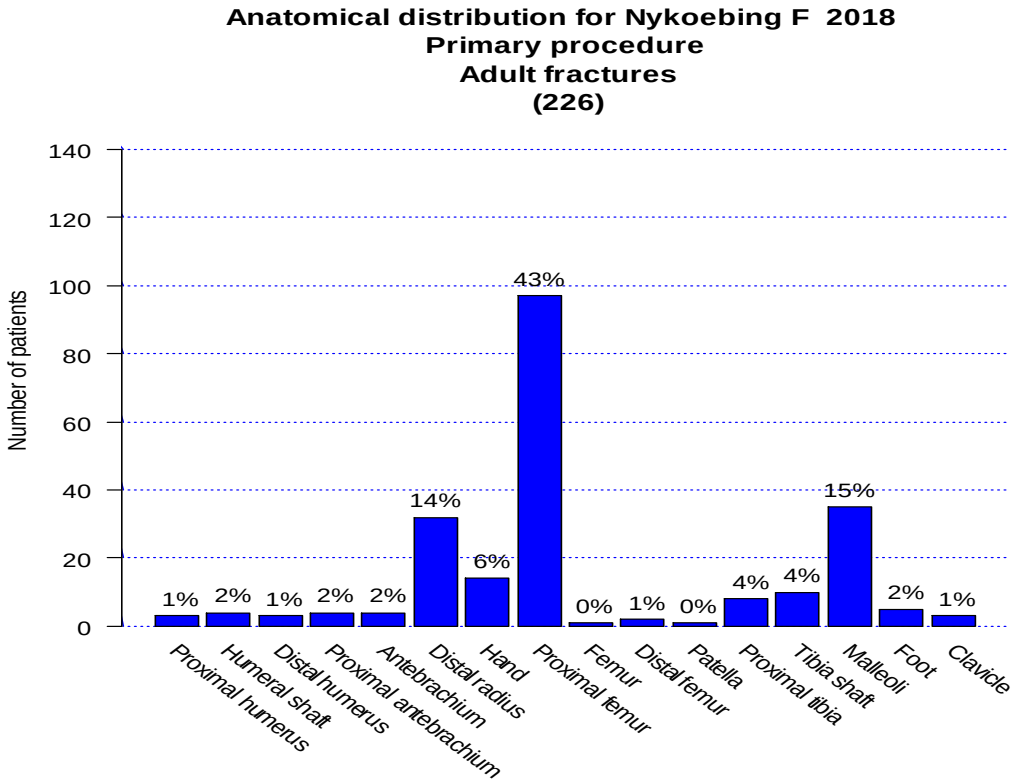

Anatomical distribution for Kolding 2018
Primary procedure
Adult fractures
(1105)
Number of patients
500
400
300
200
100
0
2%
1%
1%
3%
1%
17%
10%
38%
2%
1%
1%
3%
3%
2%
11%
2%
2%
Proximal humerus
Humeral shaft
Distal humerus
Proximal antebrachium
Antebrachium
Distal radius
Hand
Proximal femur
Femur
Distal femur
Patella
Proximal tibia
Tibia shaft
Distal tibia
Malleoli
Foot
Clavicle

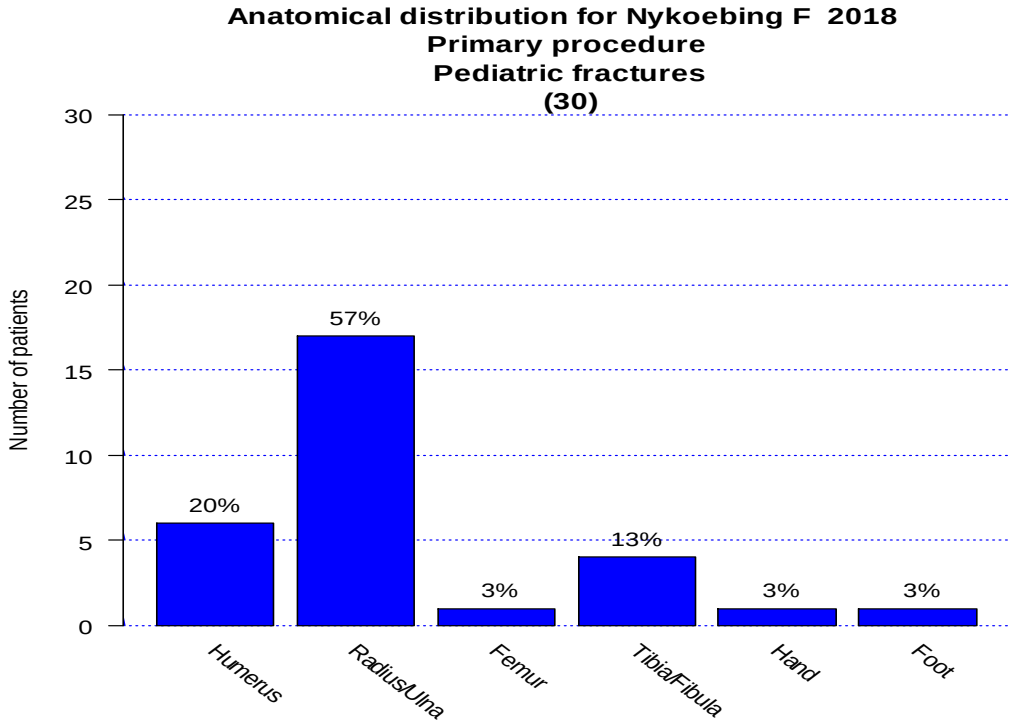

Anatomical distribution for Kolding 2018
Primary procedure
Pediatric fractures
(202)
Number of patients
200
150
100
50
0
27%
52%
2%
12%
7%
Humerus
RadiusUlna
Femur
TibiaFibula
Hand

Køge

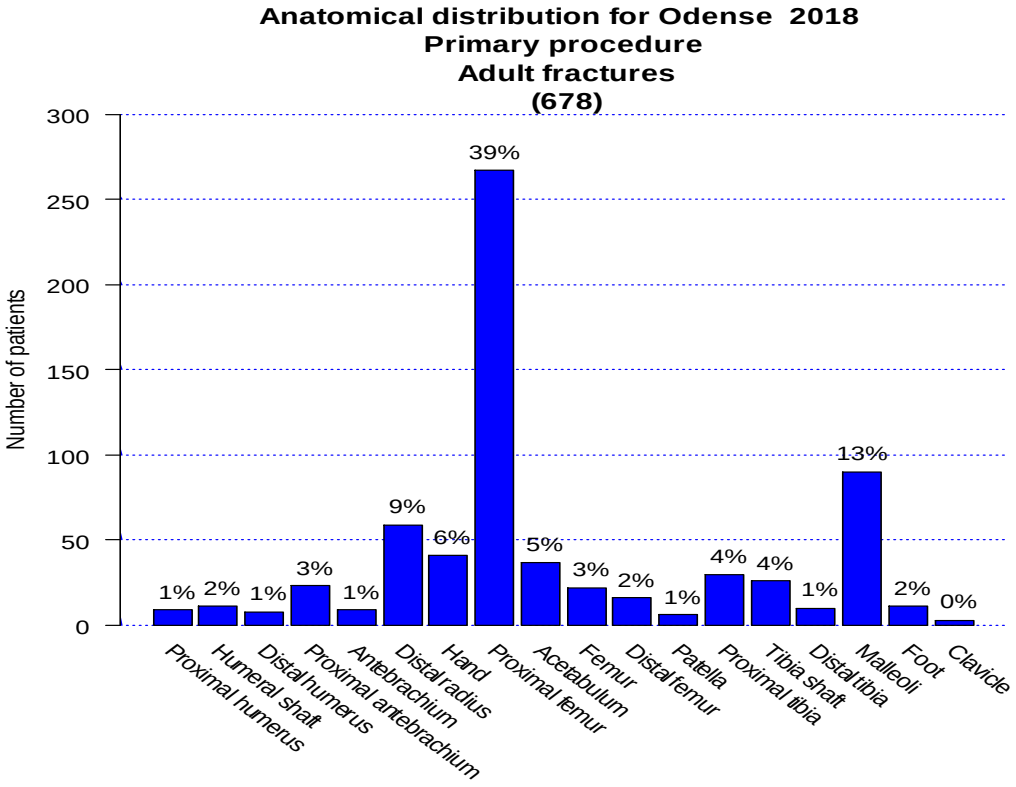

Anatomical distribution for Koege 2018
Primary procedure
Adult fractures
(537)
Number of patients
250
200
150
100
50
0
5%
1%
1%
4%
2%
22%
4%
36%
2%
1%
2%
2%
2%
1%
14%
1%
1%
0%
Proximal humerus
Humeral shaft
Distal humerus
Proximal antebrachium
Antebrachium
Distal radius
Hand
Proximal femur
Femur
Distal femur
Patella
Proximal tibia
Tibia shaft
Distal tibia
Malleoli
Foot
Clavicle
Scapula

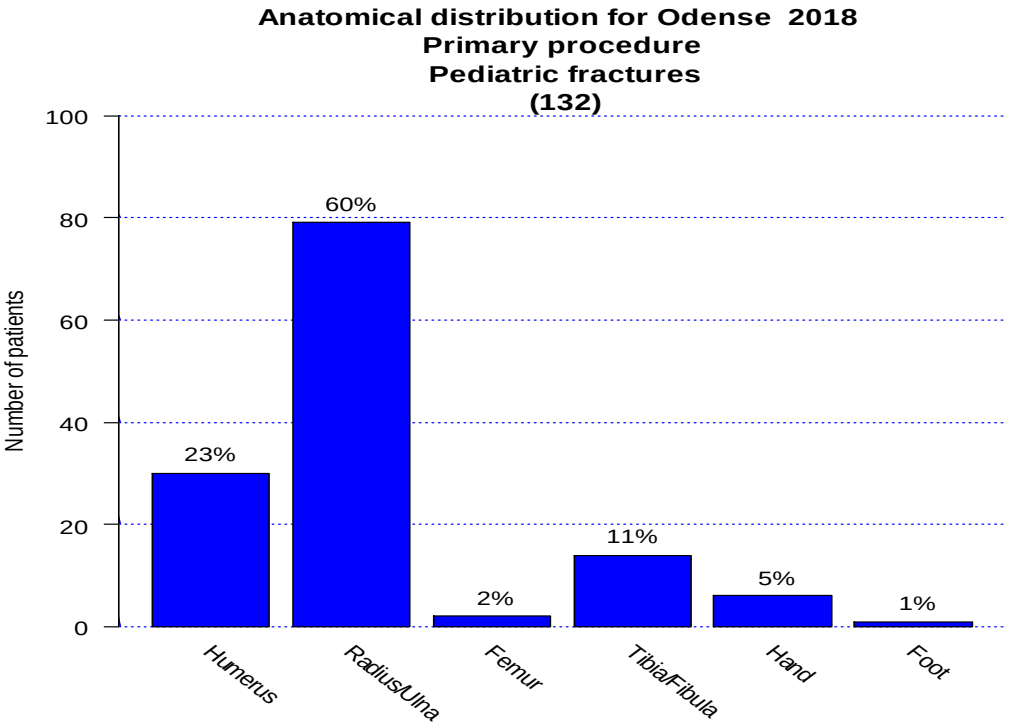

Anatomical distribution for Koege 2018
Primary procedure
Pediatric fractures
(82)
Number of patients
80
60
40
20
0
16%
67%
2%
13%
1%
Humerus
Radius/Ulna
Femur
Tibia/Fibula
Hand


Anatomical distribution for Nykoebing F 2018
Primary procedure
Adult fractures
(226)
Number of patients
140
120
100
80
60
40
20
0
1%
2%
1%
2%
2%
14%
6%
43%
0%
1%
0%
4%
4%
15%
2%
1%
Proximal humerus
Humeral shaft
Distal humerus
Proximal antebrachium
Antebrachium
Distal radius
Hand
Proximal femur
Femur
Distal femur
Patella
Proximal tibia
Tibia shaft
Malleoli
Foot
Clavicle

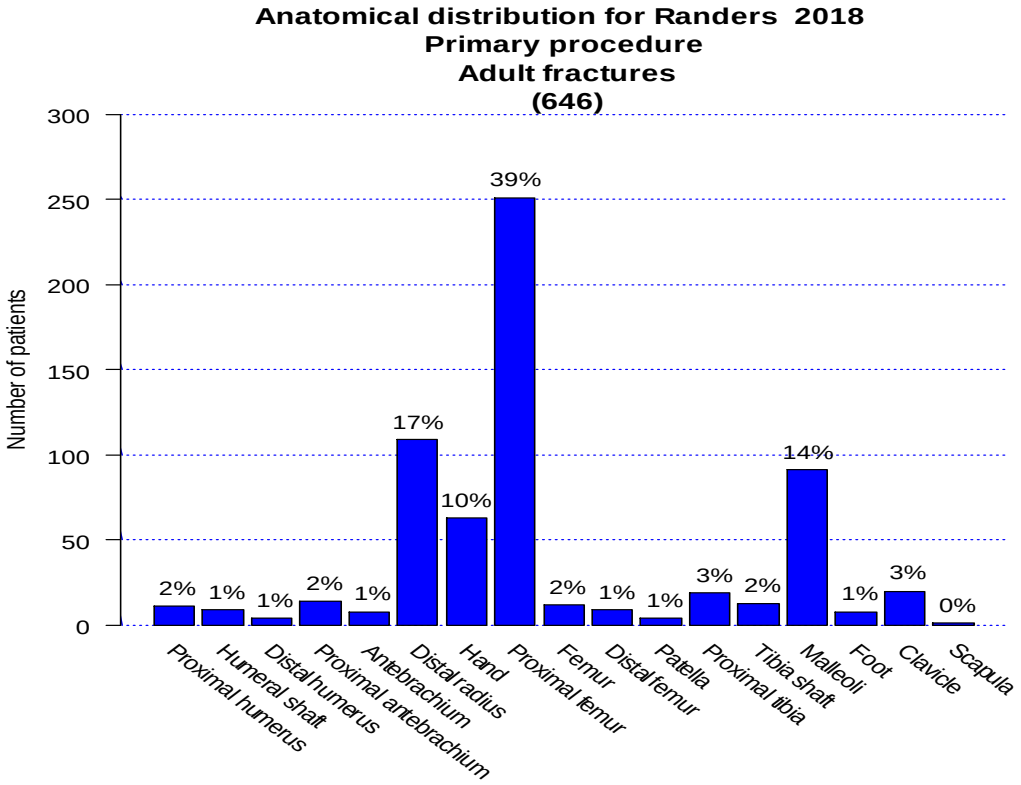

Anatomical distribution for Nykoebing F 2018
Primary procedure
Pediatric fractures
(30)
Number of patients
30
25
20
15
10
5
0
20%
57%
3%
13%
3%
3%
Humerus
Radius/Ulna
Femur
Tibia/Fibula
Hand
Foot

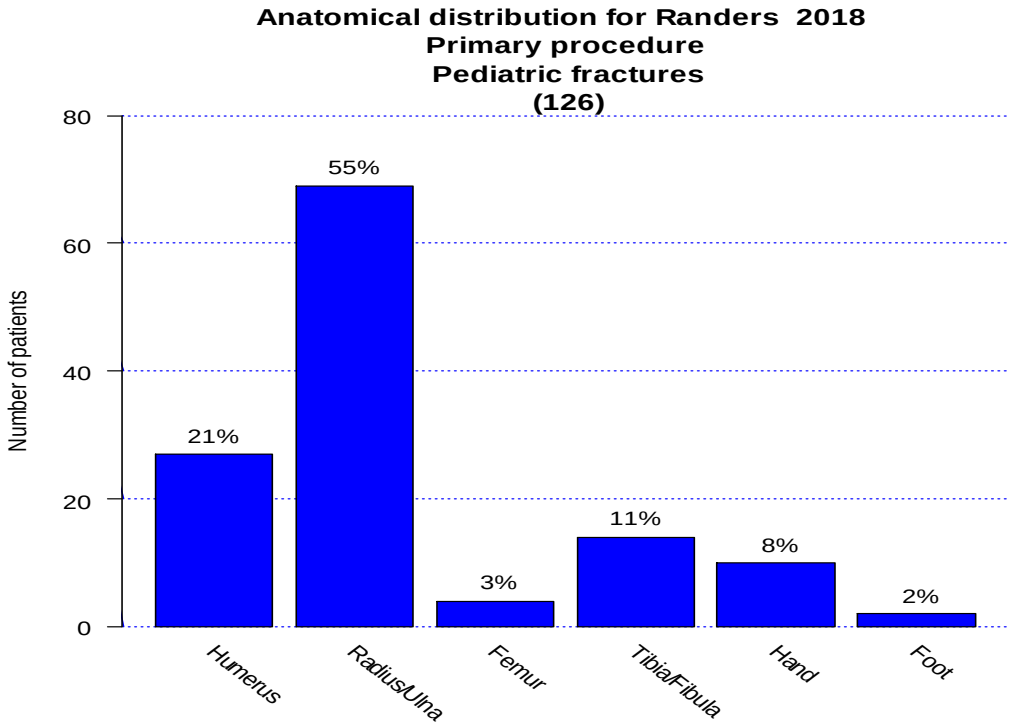
Odense

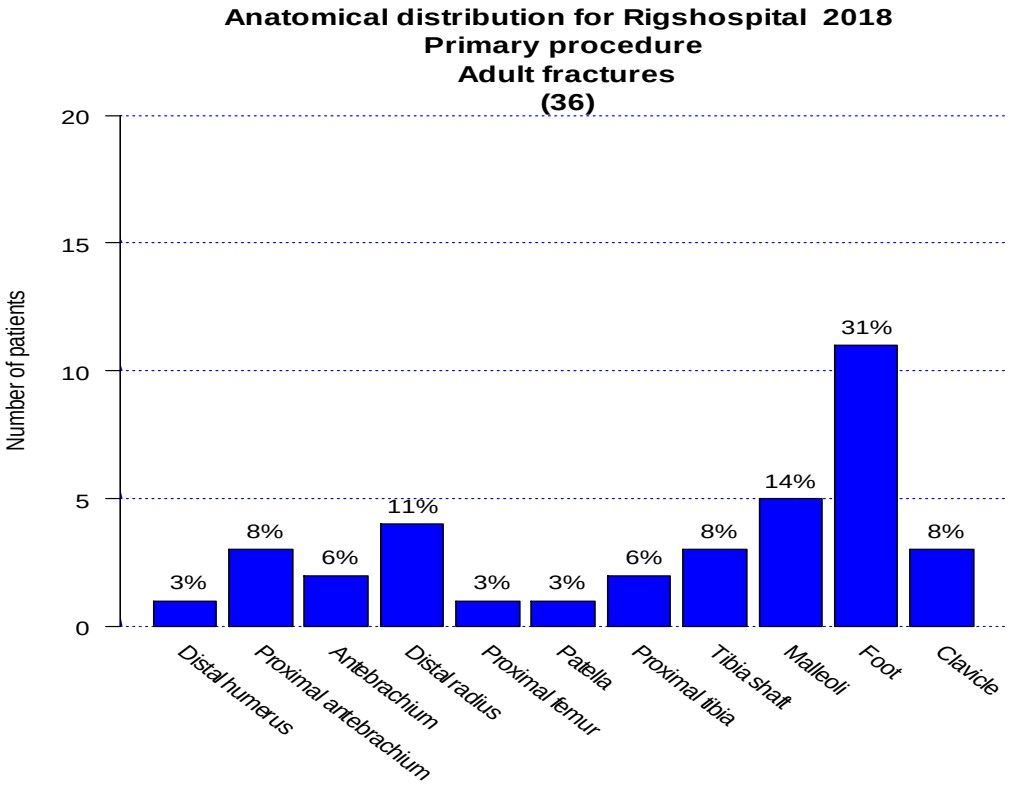

Anatomical distribution for Odense 2018
Primary procedure
Adult fractures
(678)
Number of patients
300
250
200
150
100
50
0
1%
2%
1%
3%
1%
9%
6%
39%
5%
3%
2%
1%
4%
4%
1%
13%
2%
0%
Proximal humerus
Humeral shaft
Distal humerus
Proximal antebrachium
Antebrachium
Distal radius
Hand
Proximal femur
Acetabulum
Femur
Distal femur
Patella
Proximal tibia
Tibia shaft
Distal tibia
Malleoli
Foot
Clavicle

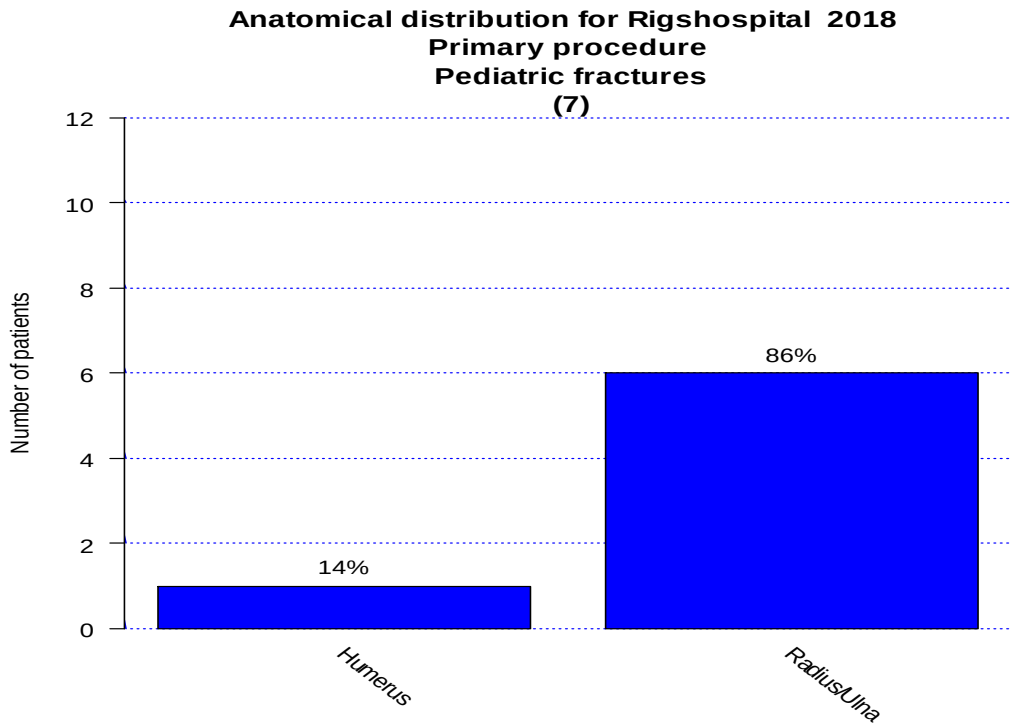

Anatomical distribution for Odense 2018
Primary procedure
Pediatric fractures
(132)
Number of patients
100
80
60
40
20
0
23%
60%
2%
11%
5%
1%
Humerus
Radius/Ulna
Femur
Tibia/Fibula
Hand
Foot

Randers

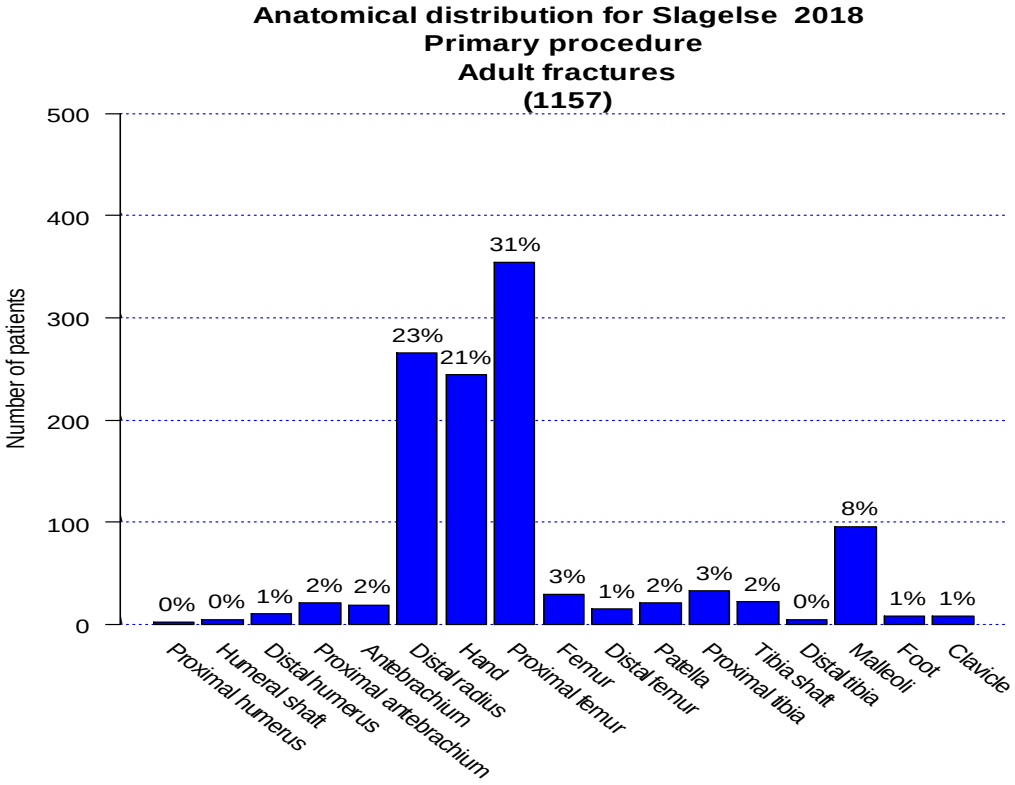

Anatomical distribution for Randers 2018
Primary procedure
Adult fractures
(646)
Number of patients
300
250
200
150
100
50
0
2%
1%
1%
2%
1%
17%
10%
39%
2%
1%
1%
3%
2%
14%
1%
3%
0%
Proximal humerus
Humeral shaft
Distal humerus
Proximal antebrachium
Antebrachium
Distal radius
Hand
Proximal femur
Femur
Distal femur
Patella
Proximal tibia
Tibia shaft
Malleoli
Foot
Clavicle
Scapula

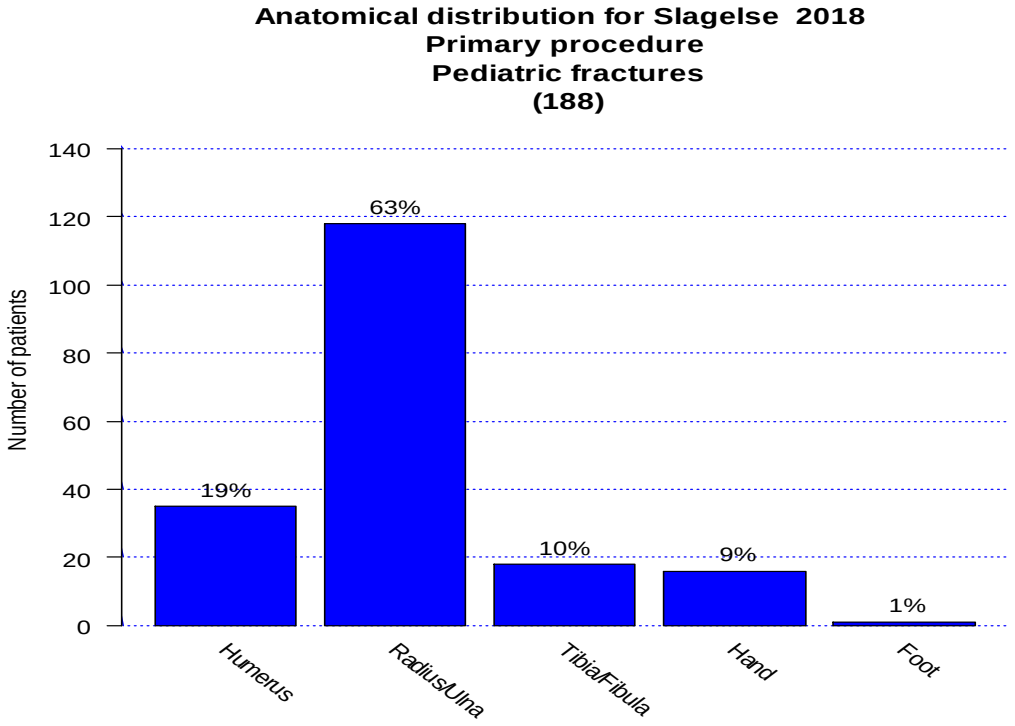

Anatomical distribution for Randers 2018
Primary procedure
Pediatric fractures
(126)
Number of patients
80
60
40
20
0
21%
55%
3%
11%
8%
2%
Humerus
Radius/Ulna
Femur
Tibia/Fibula
Hand
Foot


Anatomical distribution for Rigshospital 2018
Primary procedure
Adult fractures
(36)
Number of patients
20
15
10
5
0
3%
8%
6%
11%
3%
3%
6%
8%
14%
31%
8%
Distal humerus
Proximal antebrachium
Antebrachium
Distal radius
Proximal femur
Patella
Proximal tibia
Tibia shaft
Malleoli
Foot
Clavicle

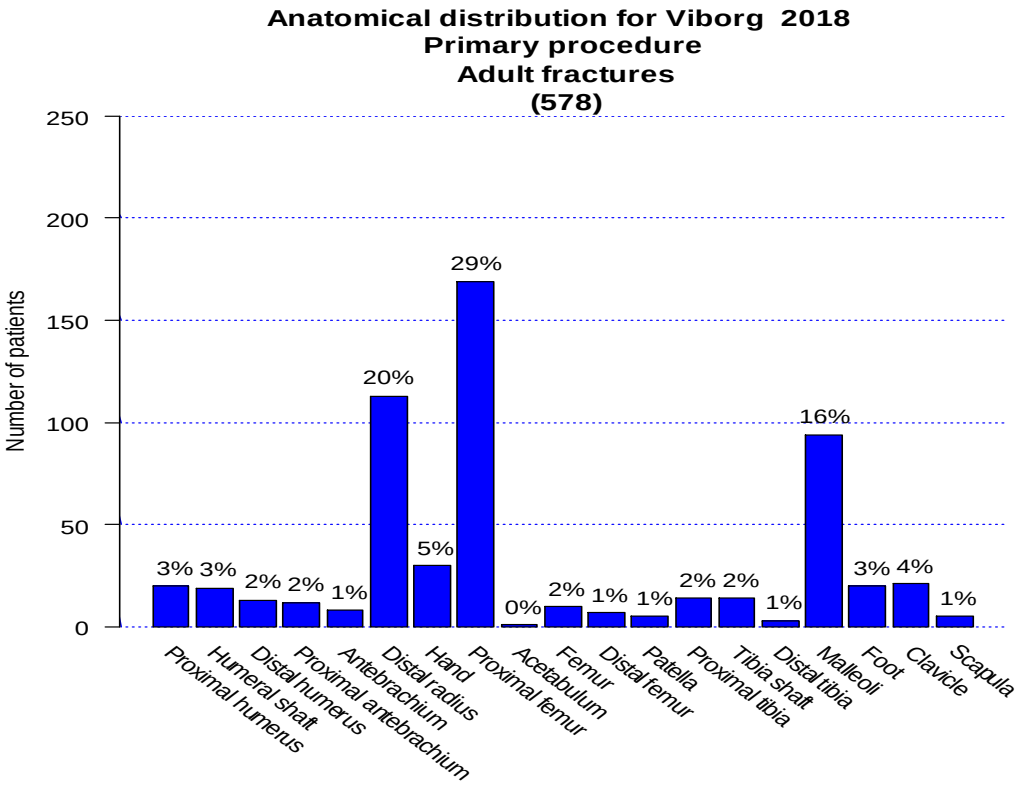

Anatomical distribution for Rigshospital 2018
Primary procedure
Pediatric fractures
(7)
Number of patients
12
10
8
6
4
2
0
14%
86%
Humerus
Radius/Ulna

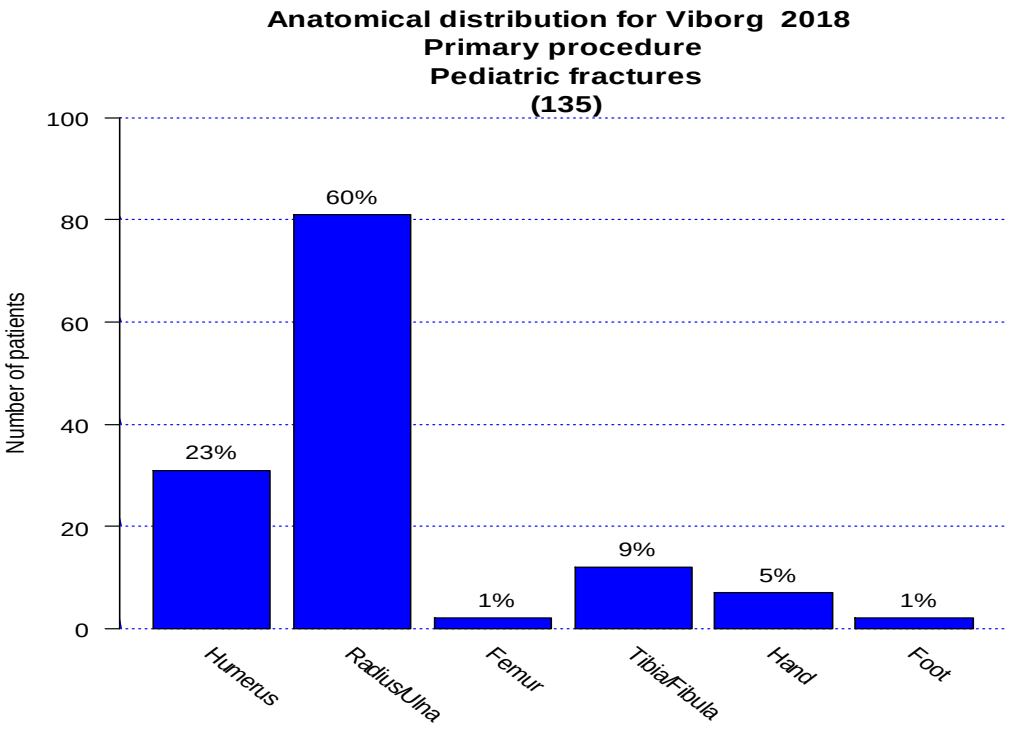
Slagelse


Anatomical distribution for Slagelse 2018
Primary procedure
Adult fractures
(1157)
Number of patients
500
400
300
200
100
0
0%
0%
1%
2%
2%
23%
21%
31%
3%
1%
2%
3%
2%
0%
8%
1%
1%
Proximal humerus
Humeral shaft
Distal humerus
Proximal antebrachium
Antebrachium
Distal radius
Hand
Proximal femur
Femur
Distal femur
Patella
Proximal tibia
Tibia shaft
Distal tibia
Malleoli
Foot
Clavicle


Anatomical distribution for Slagelse 2018
Primary procedure
Pediatric fractures
(188)
Number of patients
140
120
100
80
60
40
20
0
19%
63%
10%
9%
1%
Humerus
Radius/Ulna
Tibia/Fibula
Hand
Foot

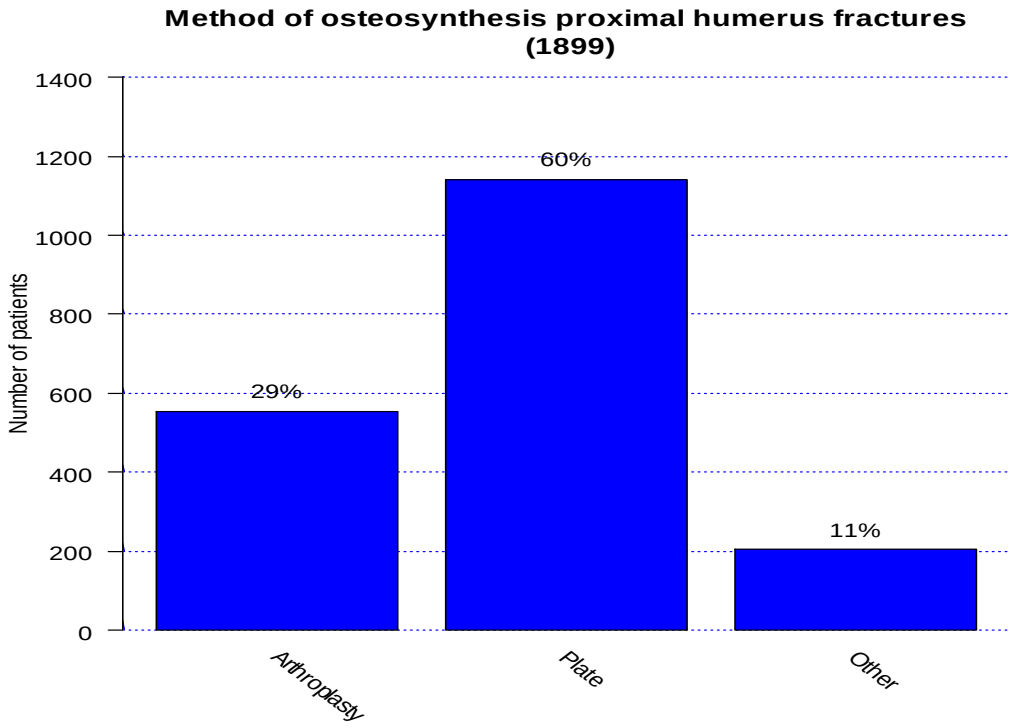
Viborg

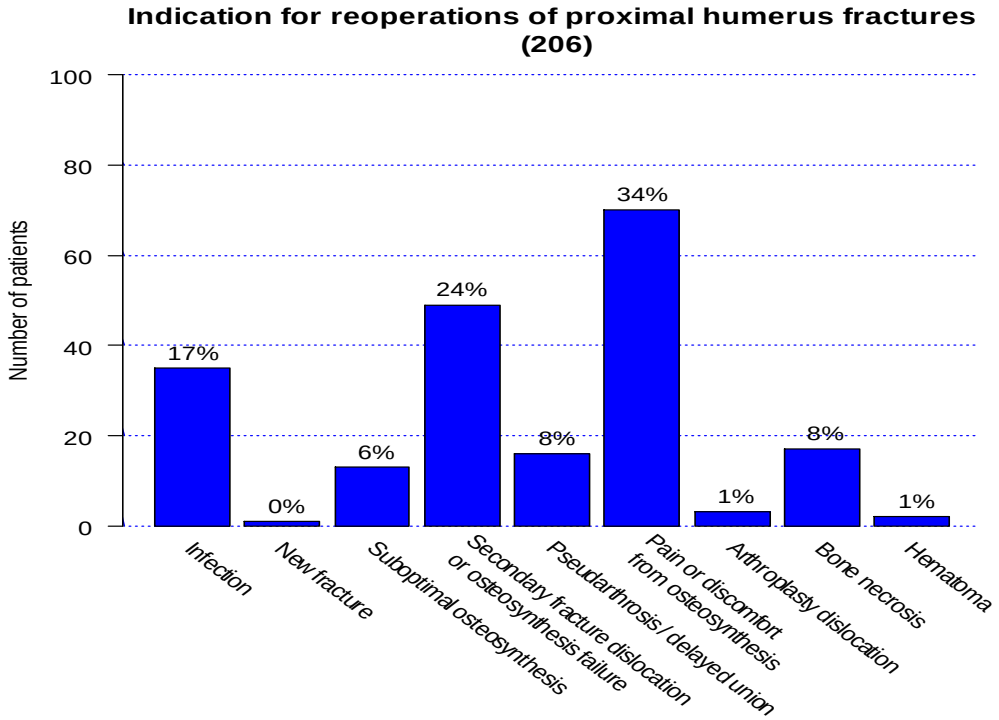

Anatomical distribution for Viborg 2018
Primary procedure
Adult fractures
(578)
Number of patients
250
200
150
100
50
0
3% 3% 2% 2% 1% 20% 5% 29% 0% 2% 1% 1% 2% 2% 1% 16% 3% 4% 1%
Proximal humerus
Humeral shaft
Distal humerus
Proximal antebrachium
Antebrachium
Distal radius
Hand
Proximal femur
Acetabulum
Femur
Distal femur
Patella
Proximal tibia
Tibia shaft
Distal tibia
Malleoli
Foot
Clavicle
Scapula

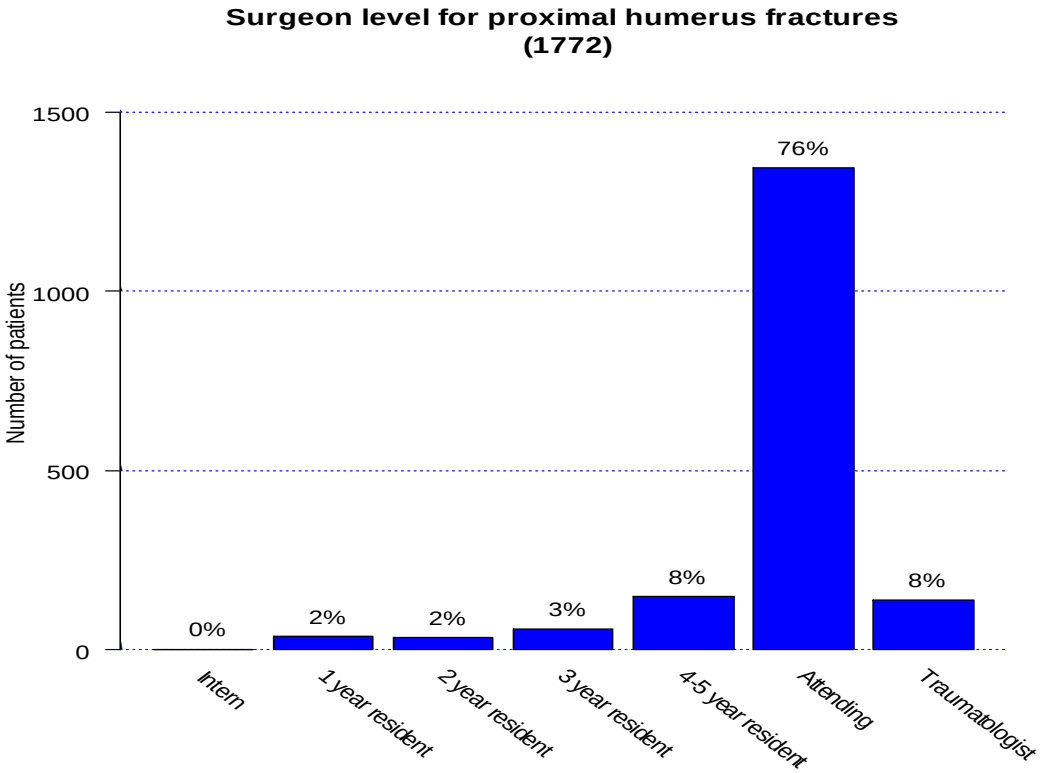

Anatomical distribution for Viborg 2018
Primary procedure
Pediatric fractures
(135)
Number of patients
100
80
60
40
20
0
23% 60% 1% 9% 5% 1%
Humerus
Radius/Ulna
Femur
Tibia/Fibula
Hand
Foot

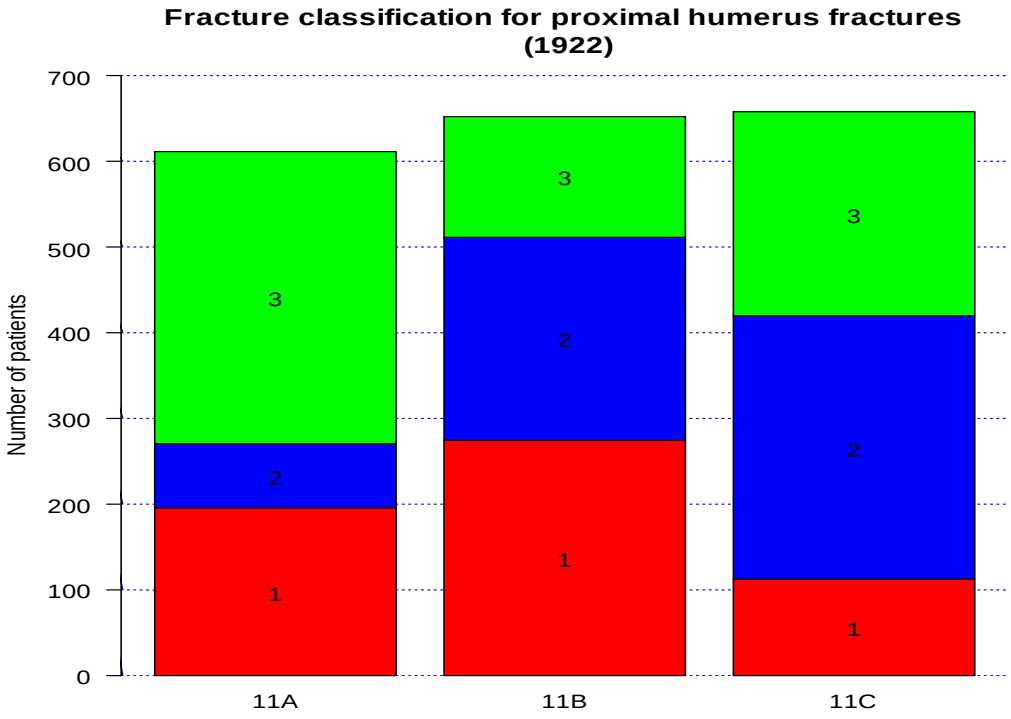
Adult

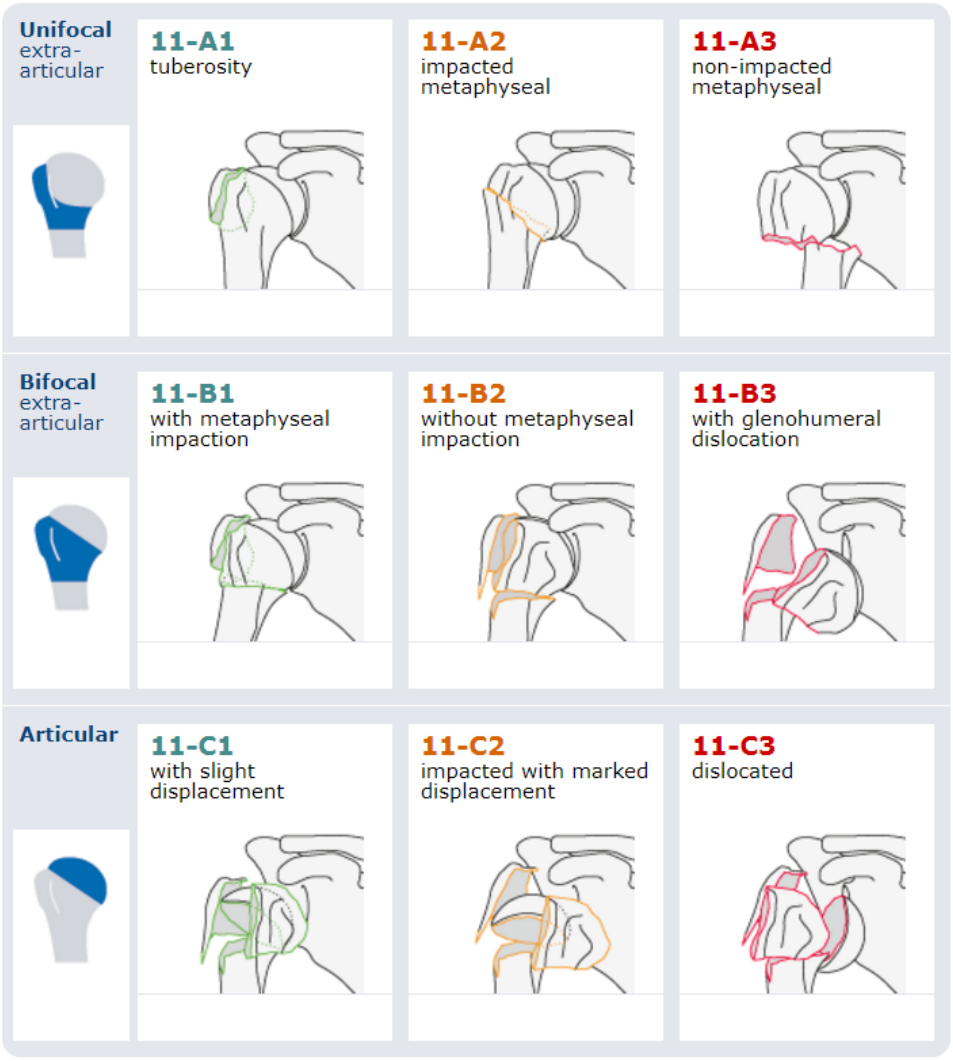
Proximal Humerus



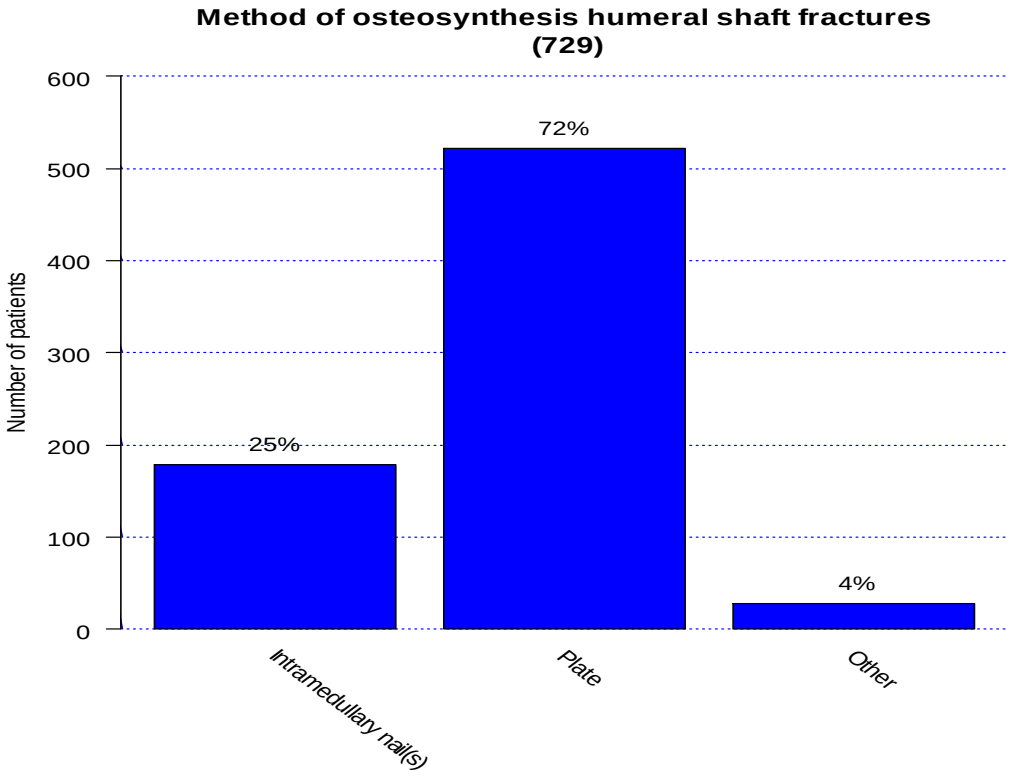


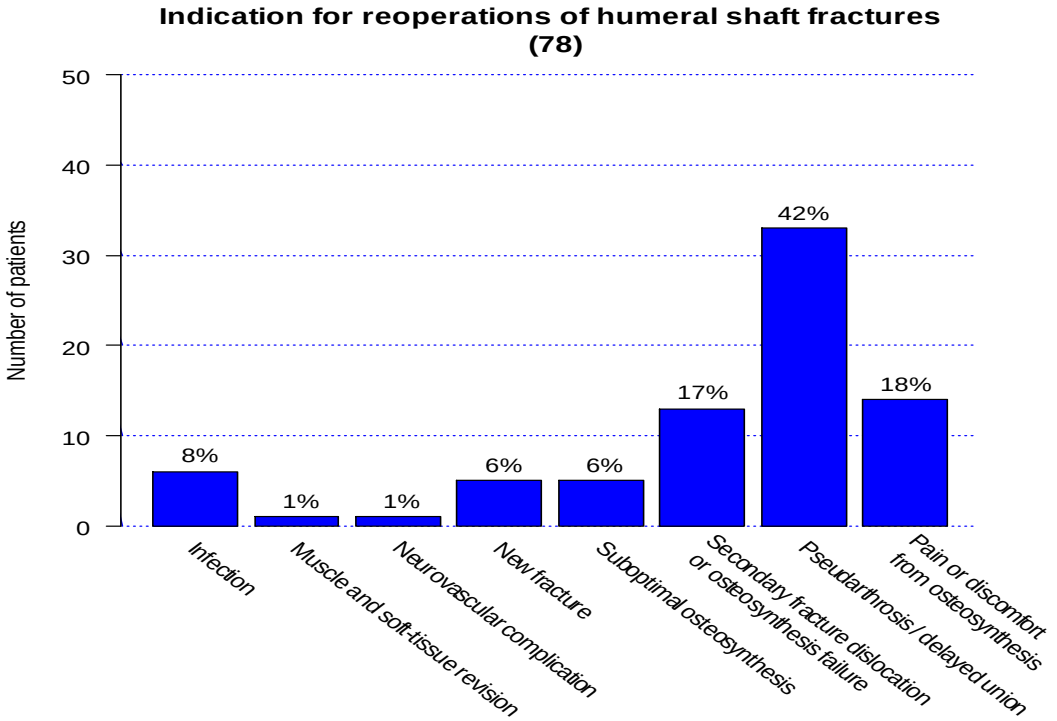

Surgeon level for proximal humerus fractures
(1772)
Number of patients
1500
1000
500
0
0%
2%
2%
3%
8%
76%
8%
Intern
1 year resident
2 year resident
3 year resident
4-5 year resident
Attending
Traumatologist

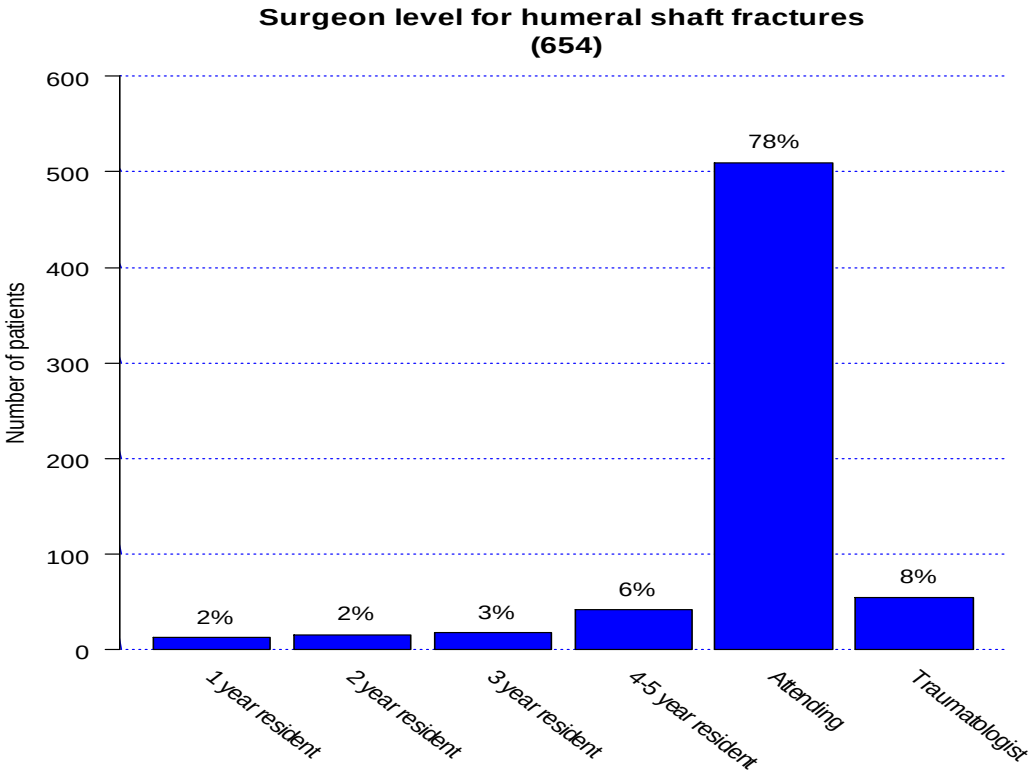


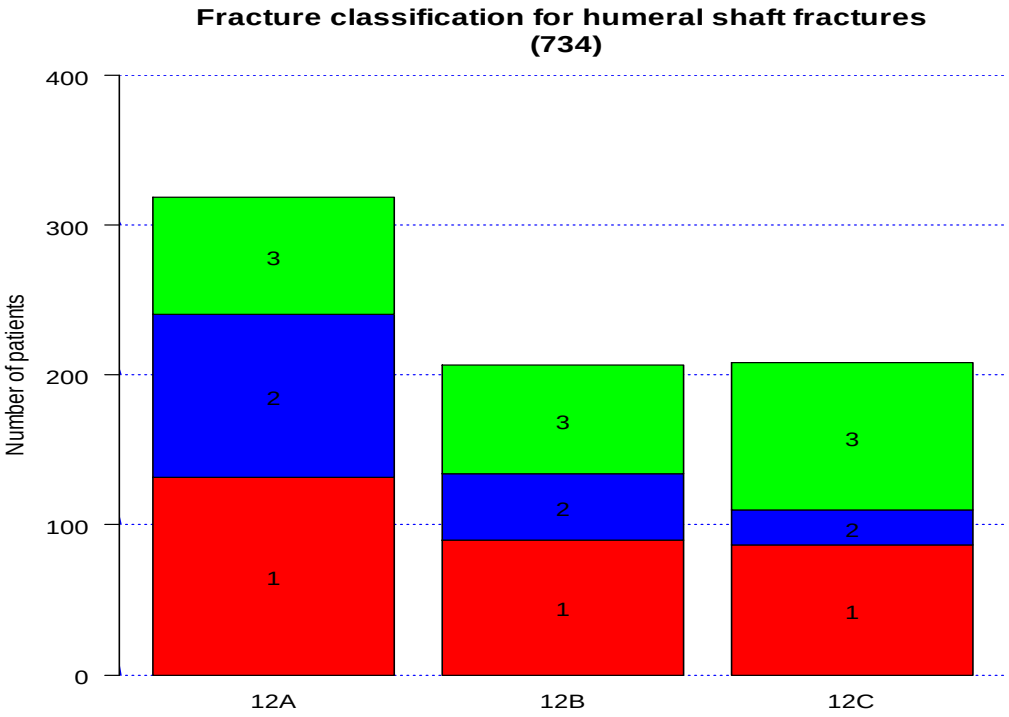


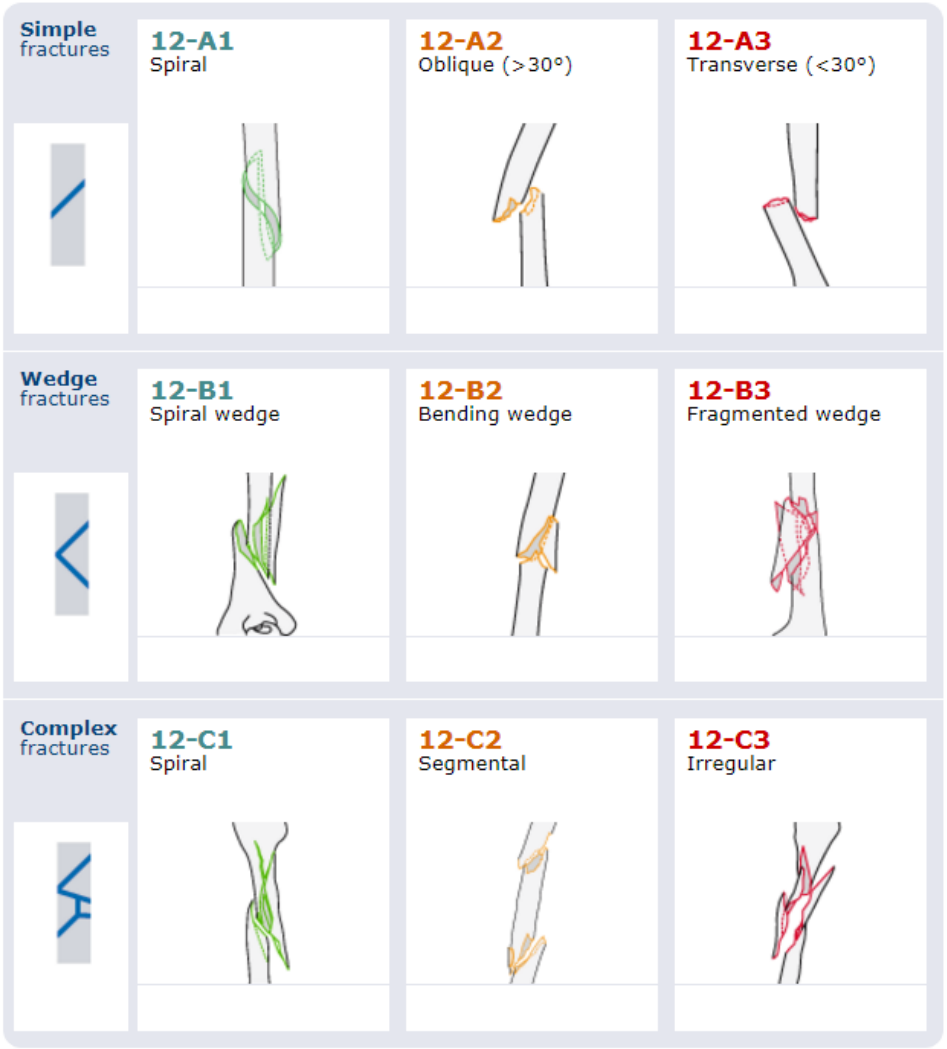
Humeral shaft



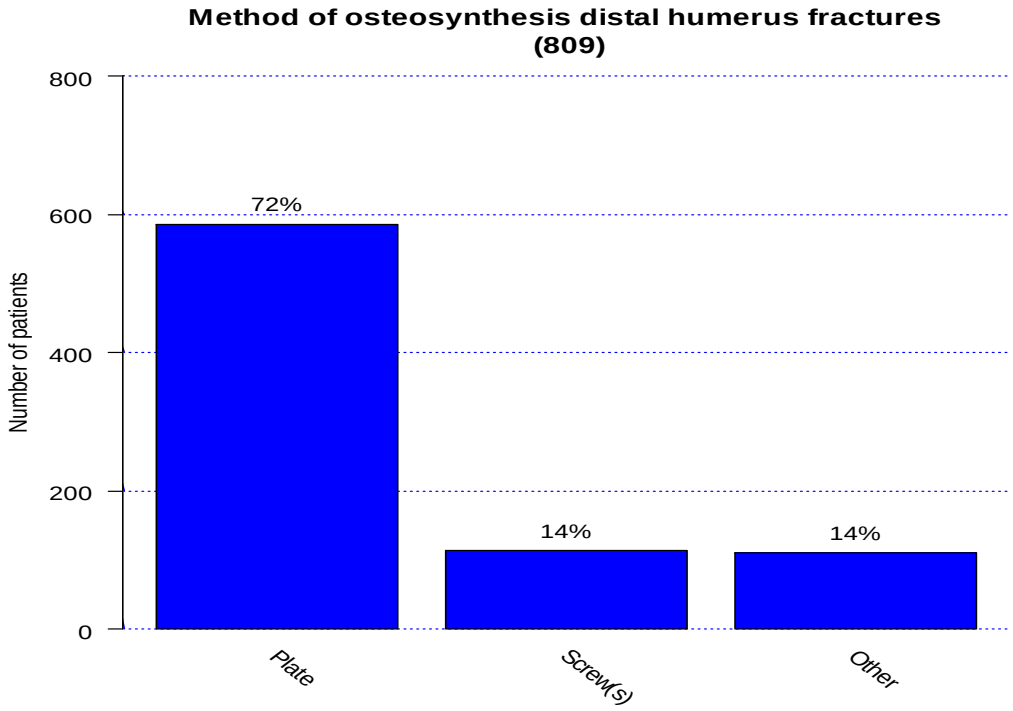


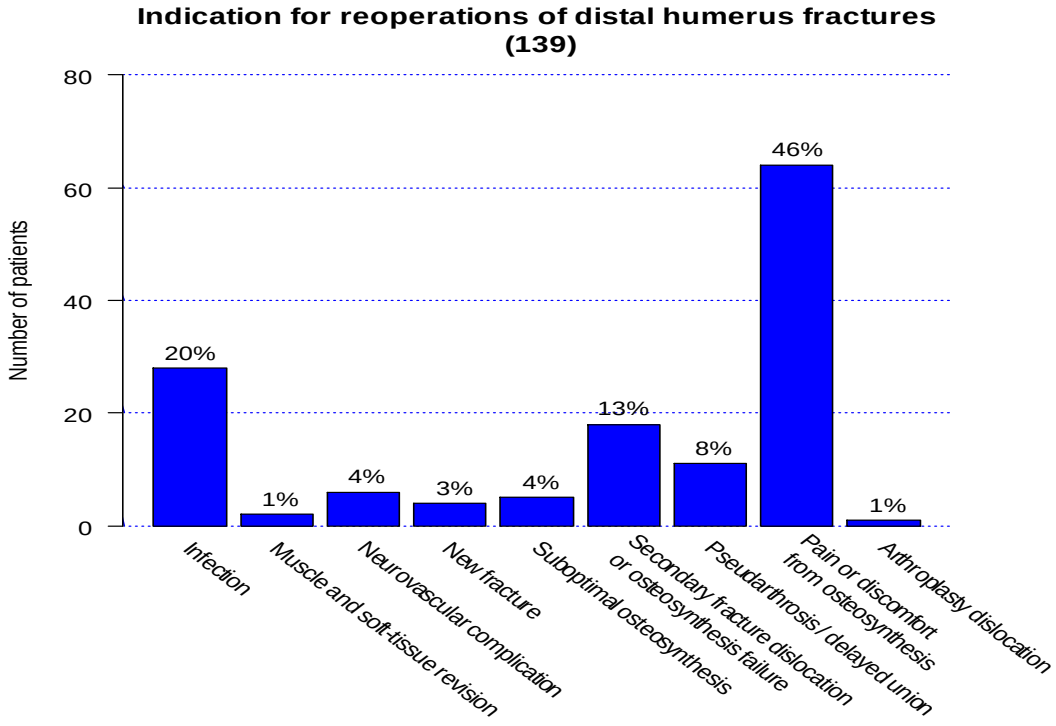

Surgeon level for humeral shaft fractures
(654)
Number of patients
600
500
400
300
200
100
0
2%
2%
3%
6%
78%
8%
1 year resident
2 year resident
3 year resident
4-5 year resident
Attending
Traumatologist

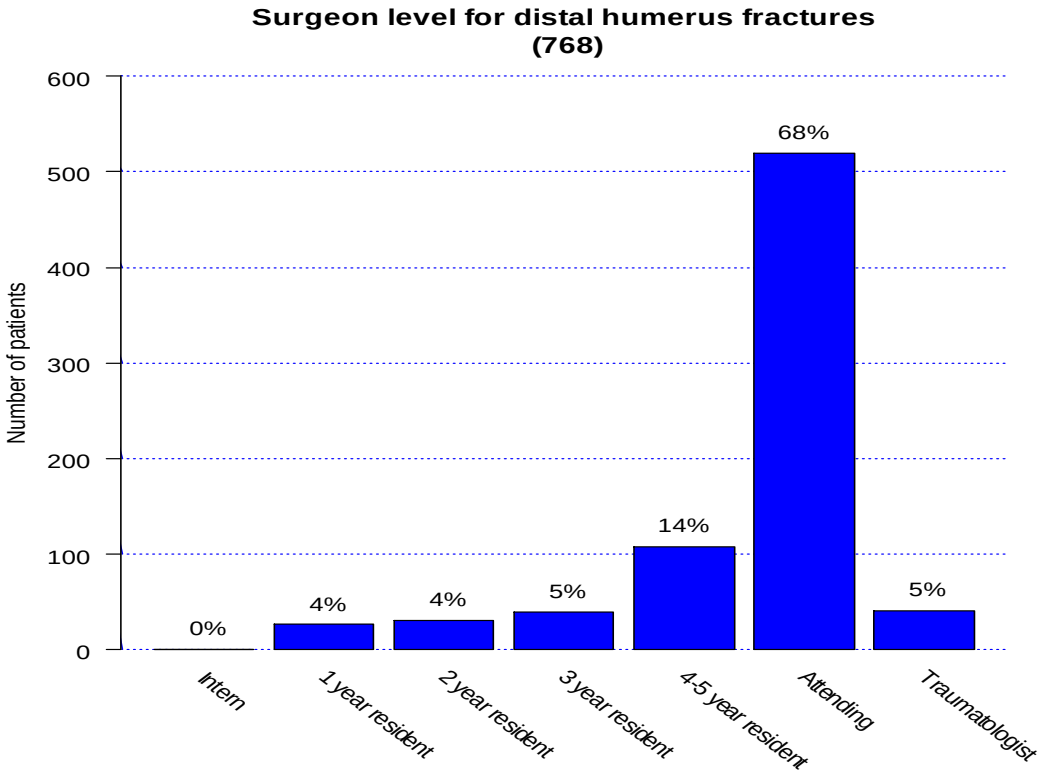


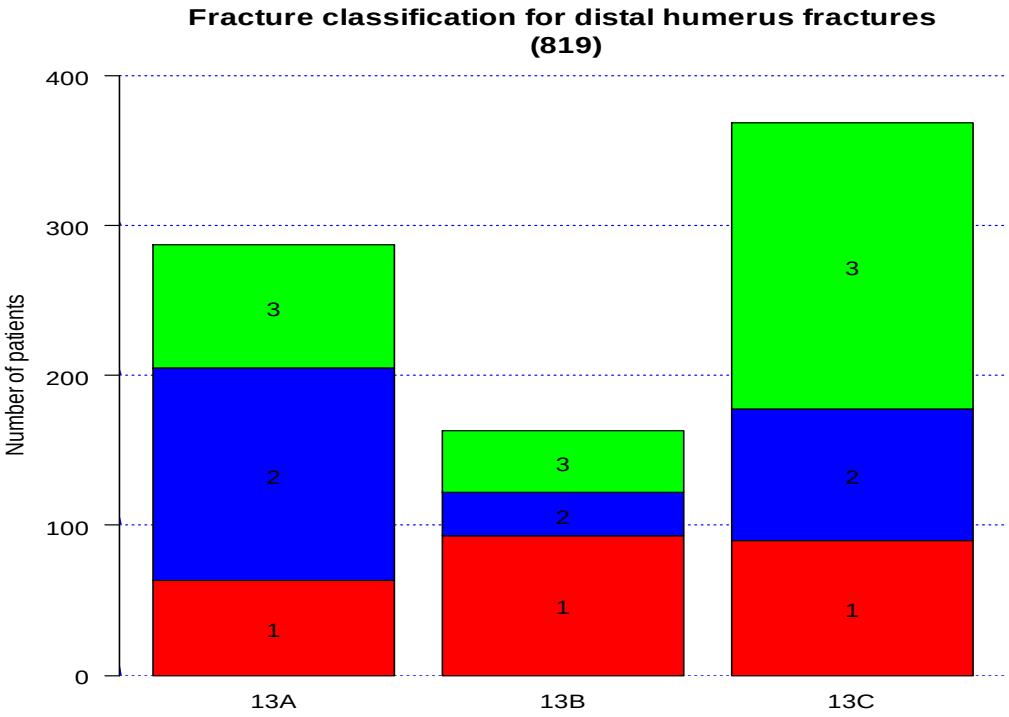


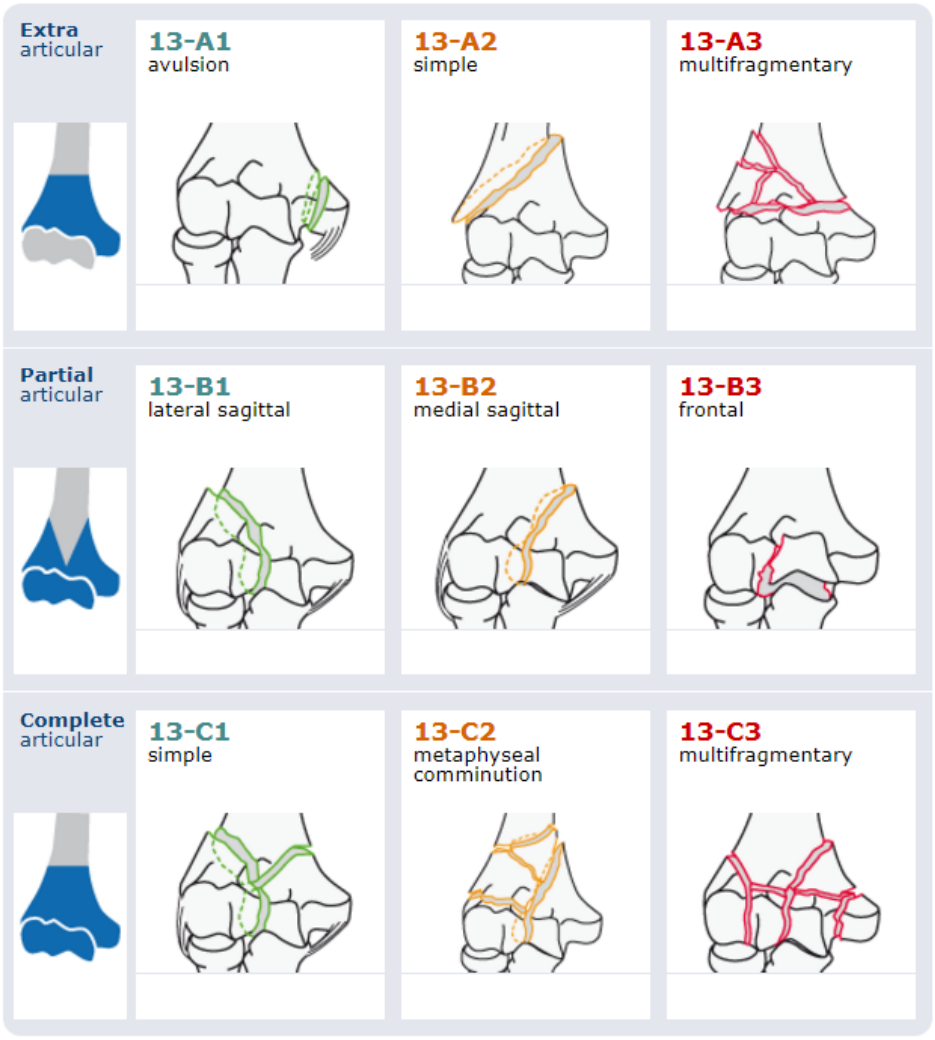
Distal Humerus



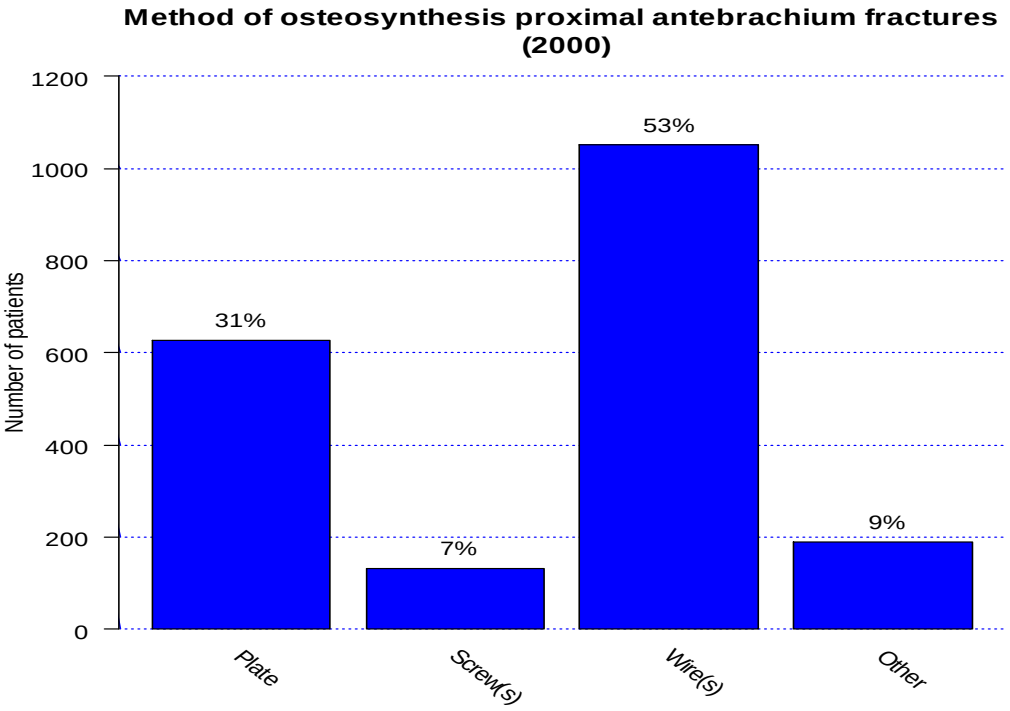


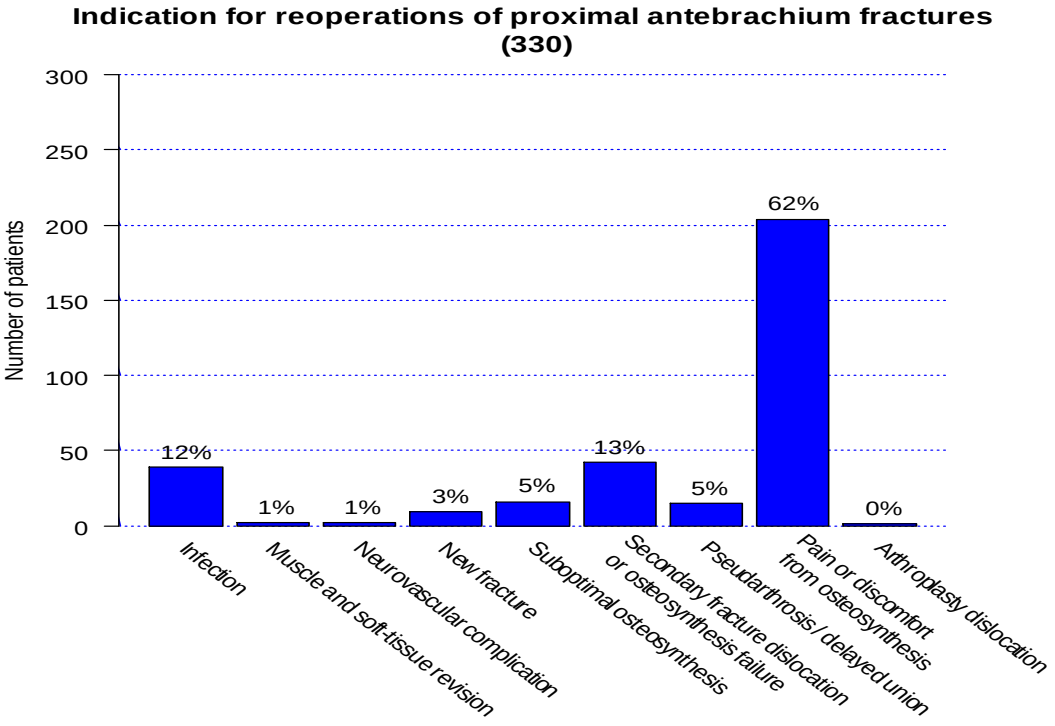

Surgeon level for distal humerus fractures
(768)
Number of patients
600
500
400
300
200
100
0
0%
4%
4%
5%
14%
68%
5%
Intern
1 year resident
2 year resident
3 year resident
4-5 year resident
Attending
Traumatologist

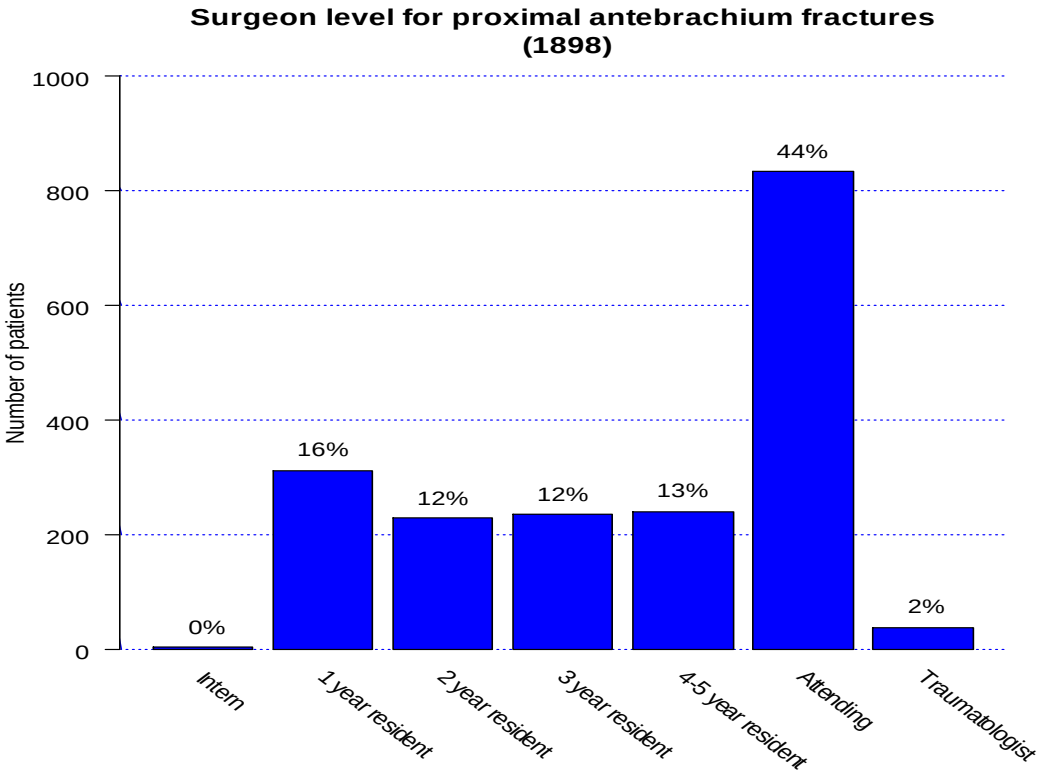


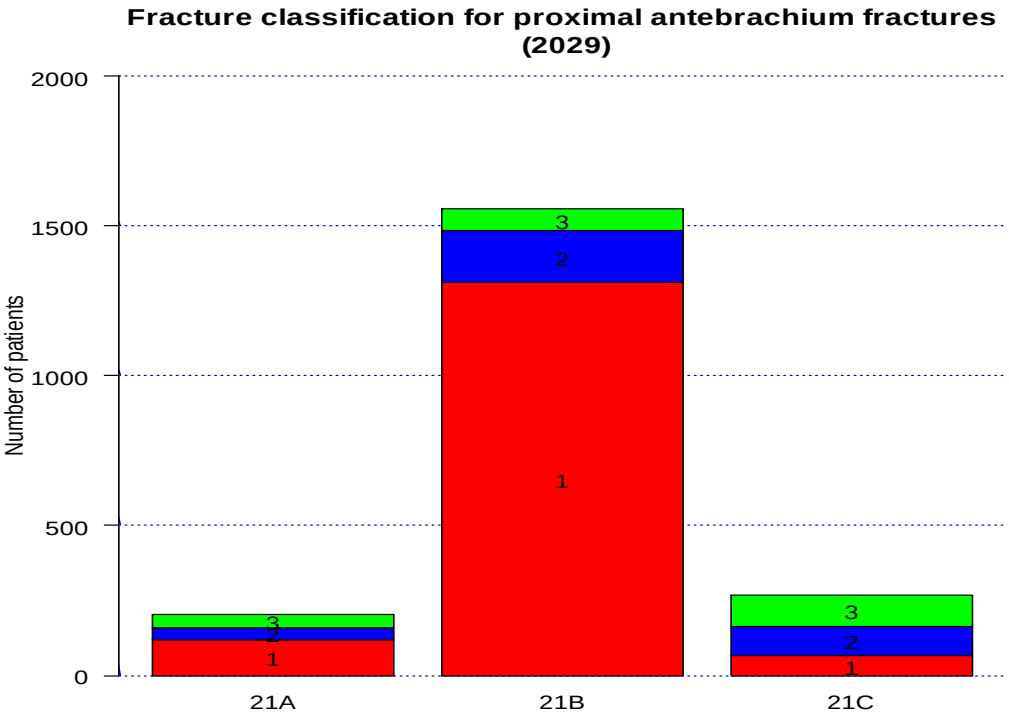


Proximal antebrachium

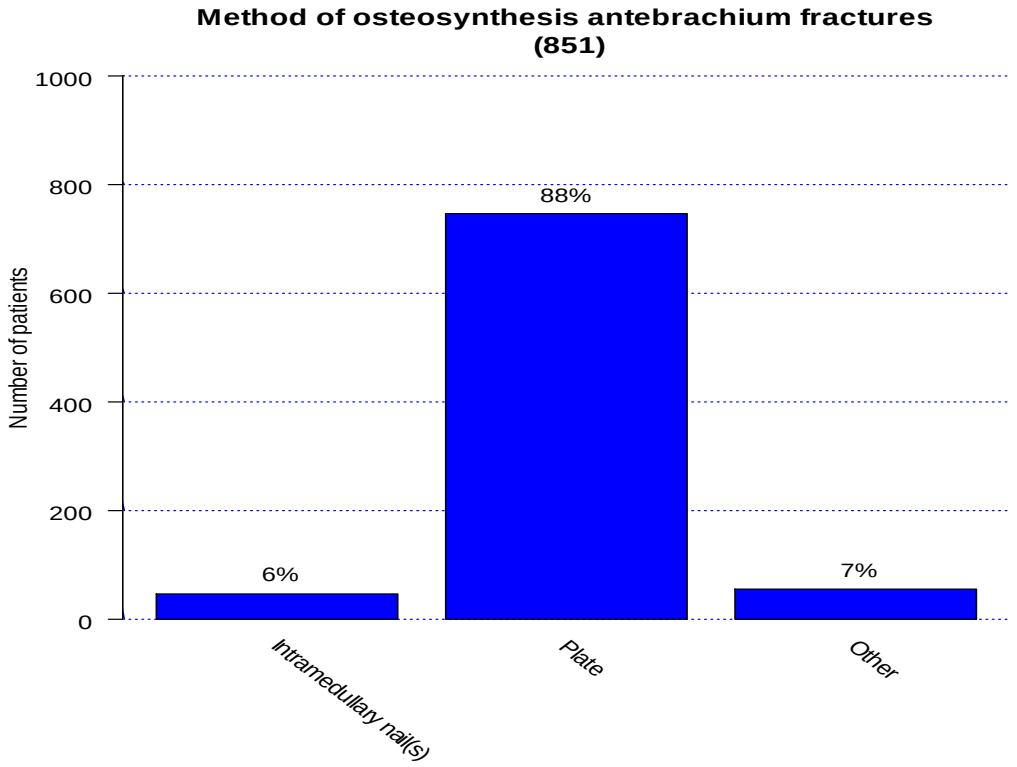


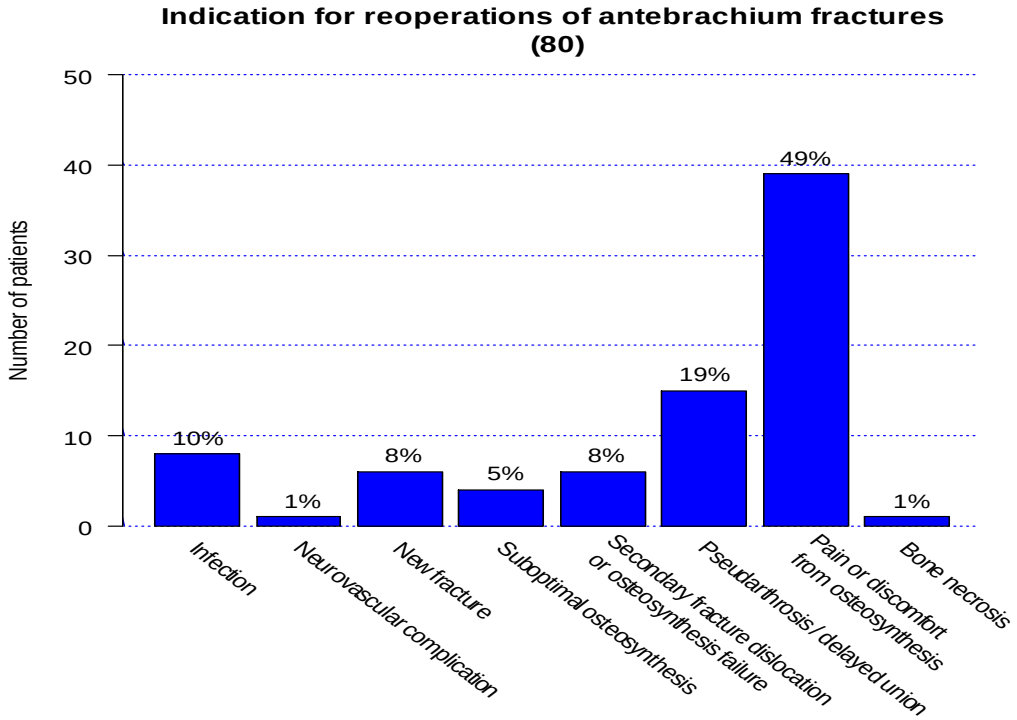


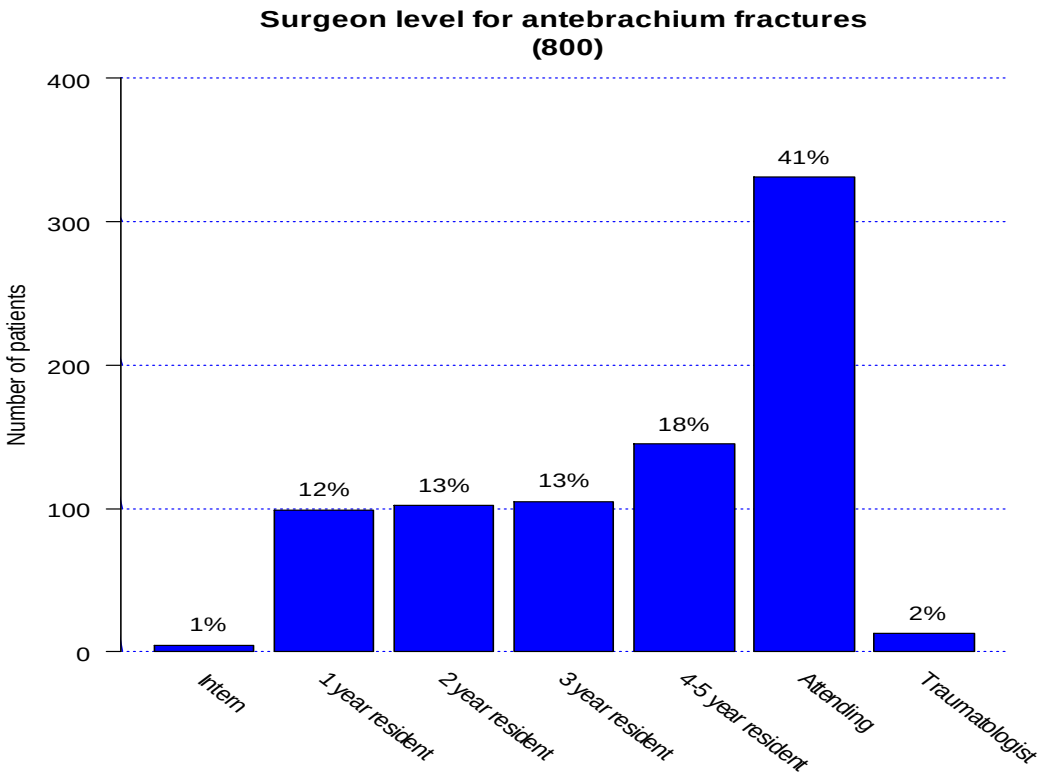

Surgeon level for proximal antebrachium fractures (1898)
Number of patients
1000
800
600
400
200
0
0%
16%
12%
12%
13%
44%
2%
Intern
1 year resident
2 year resident
3 year resident
4-5 year resident
Attending
Traumatologist

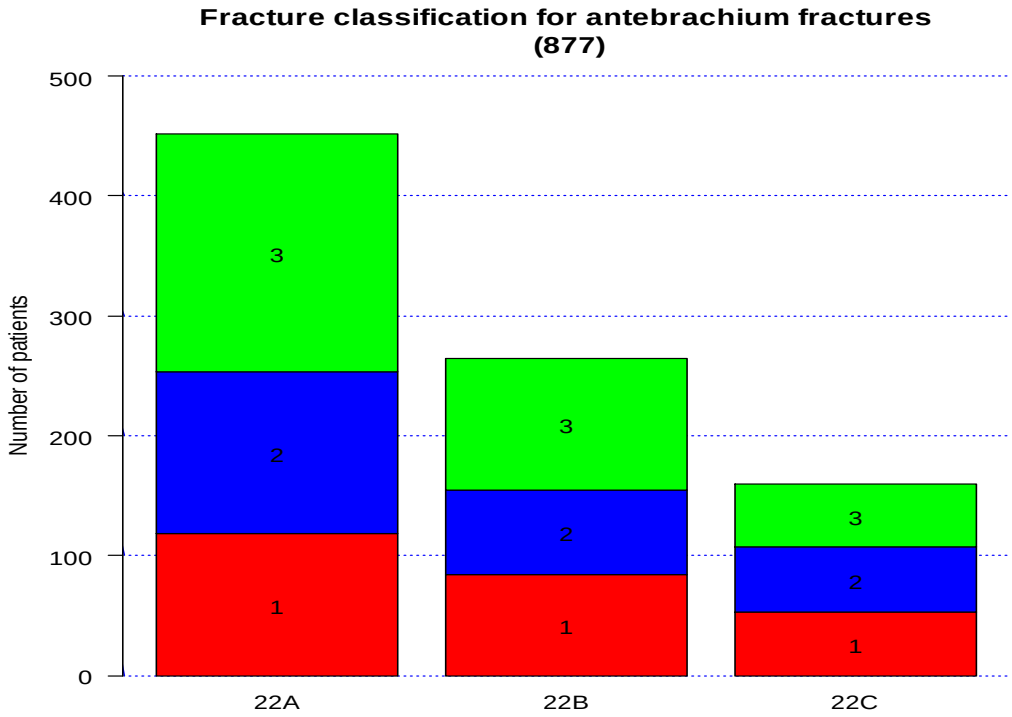


Antebrachium

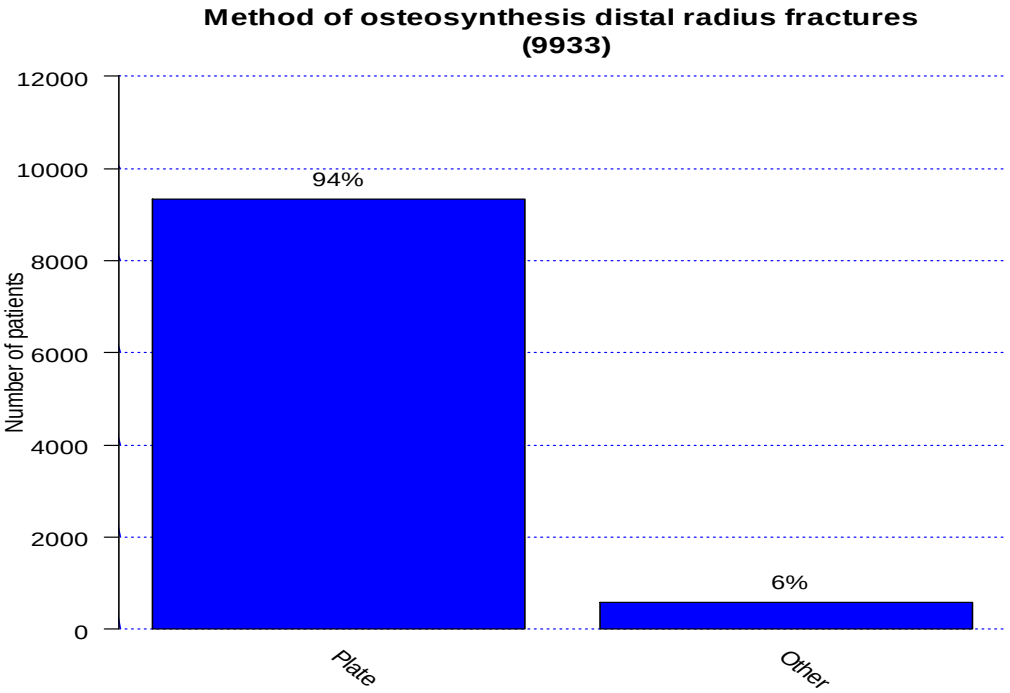


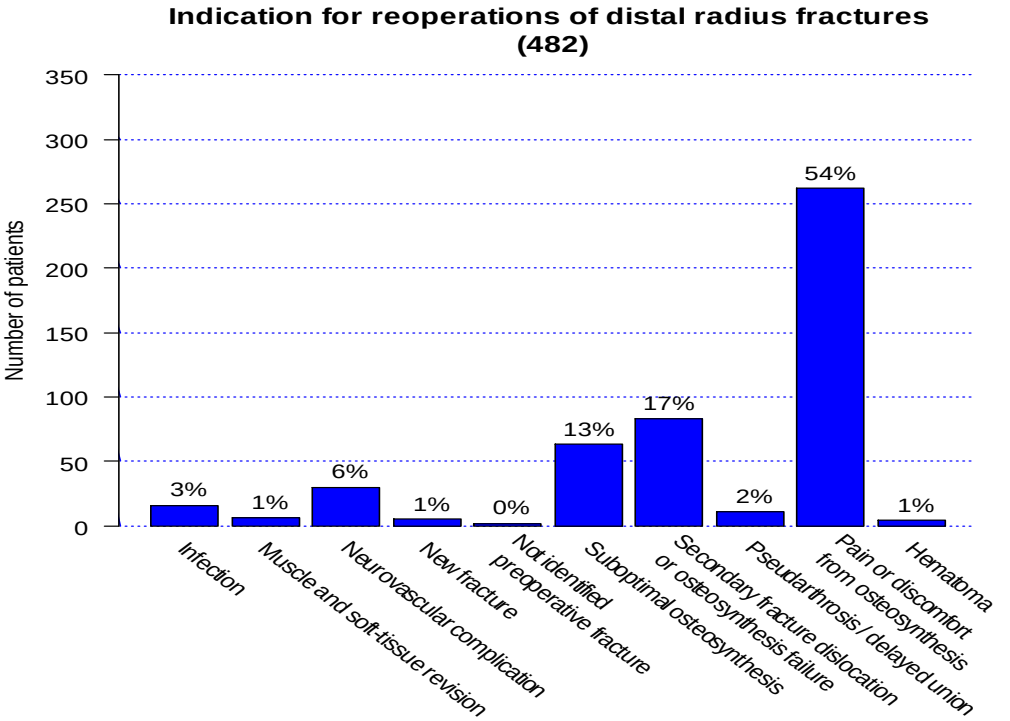


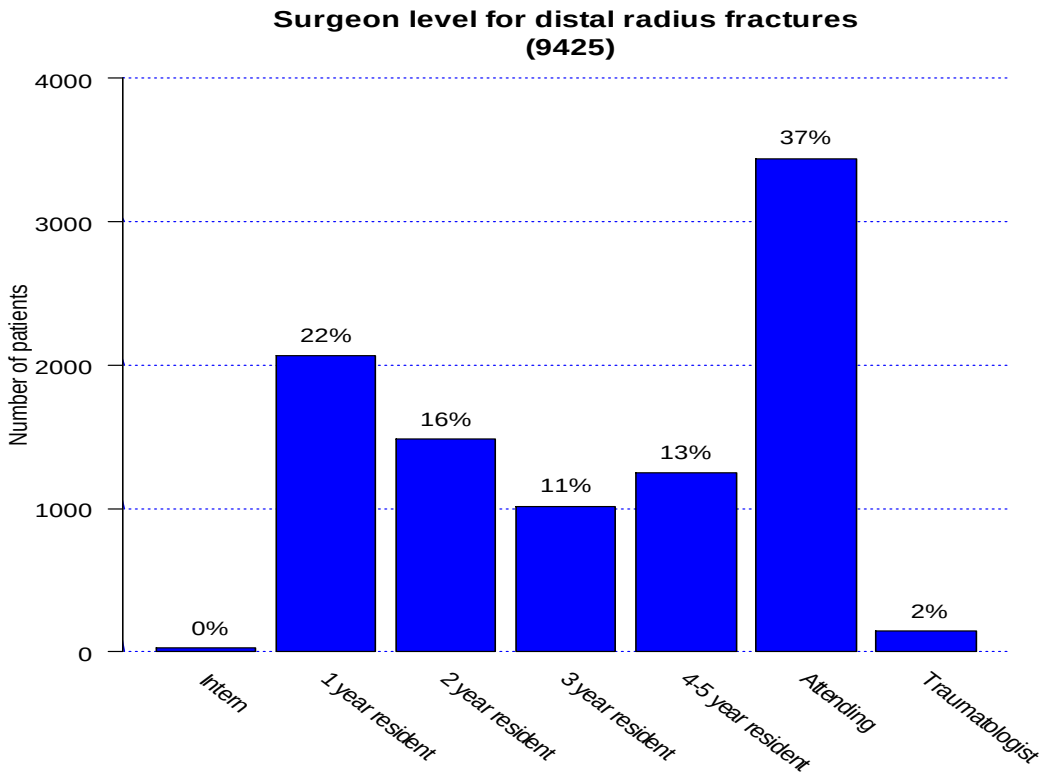

Surgeon level for antebrachium fractures
(800)
Number of patients
400
300
200
100
0
1%
12%
13%
13%
18%
41%
2%
Intern
1 year resident
2 year resident
3 year resident
4-5 year resident
Attending
Traumatologist

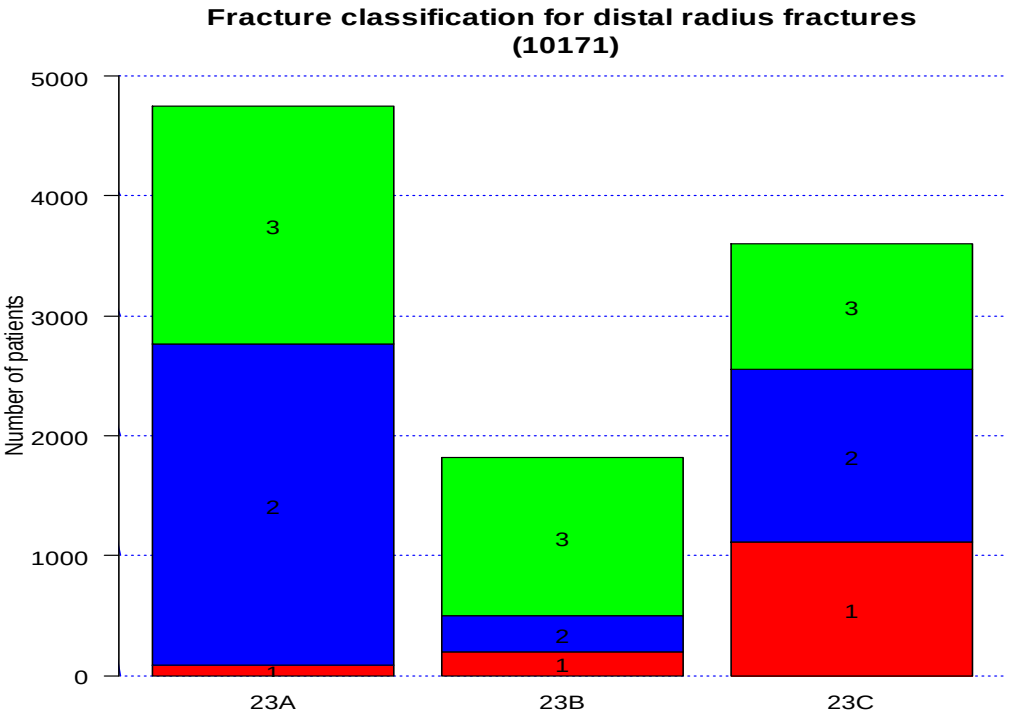


Distal radius

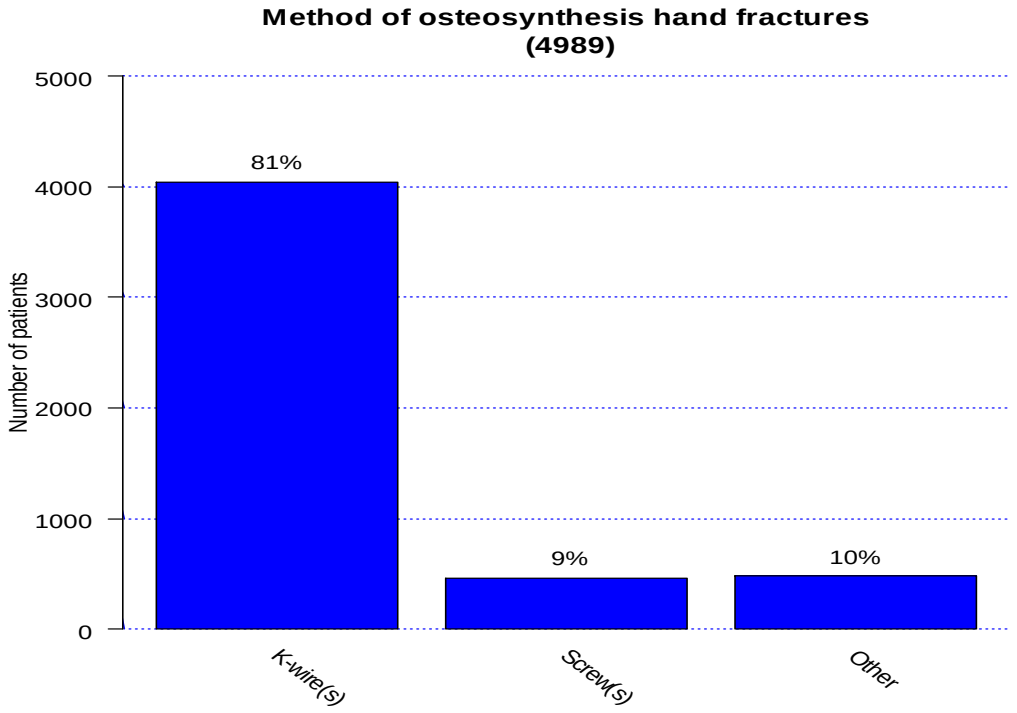


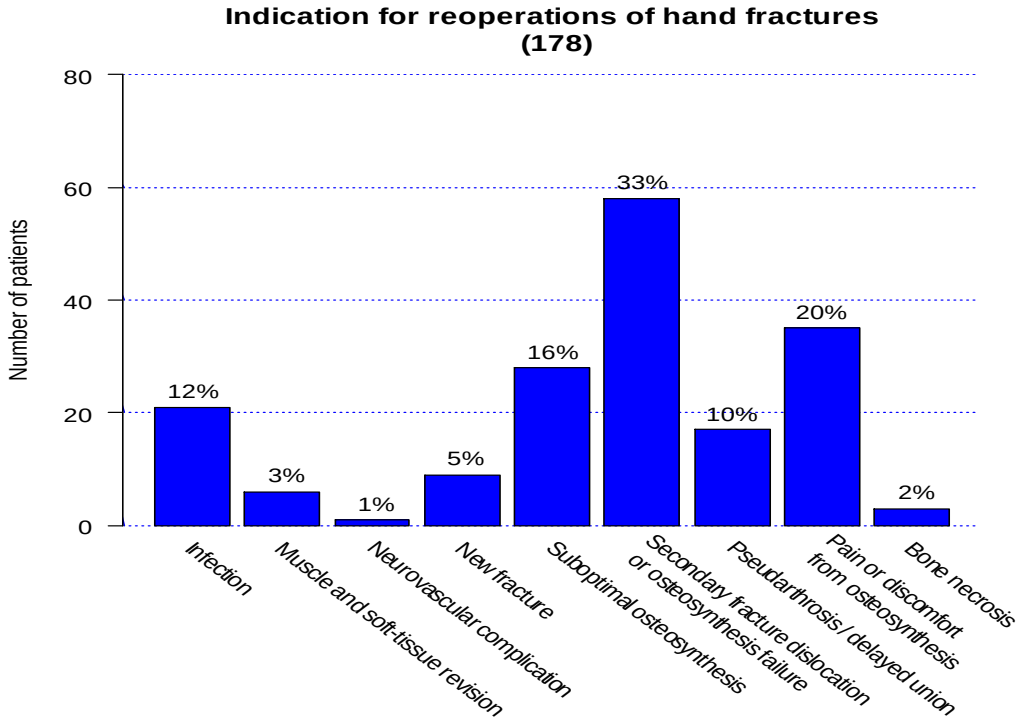


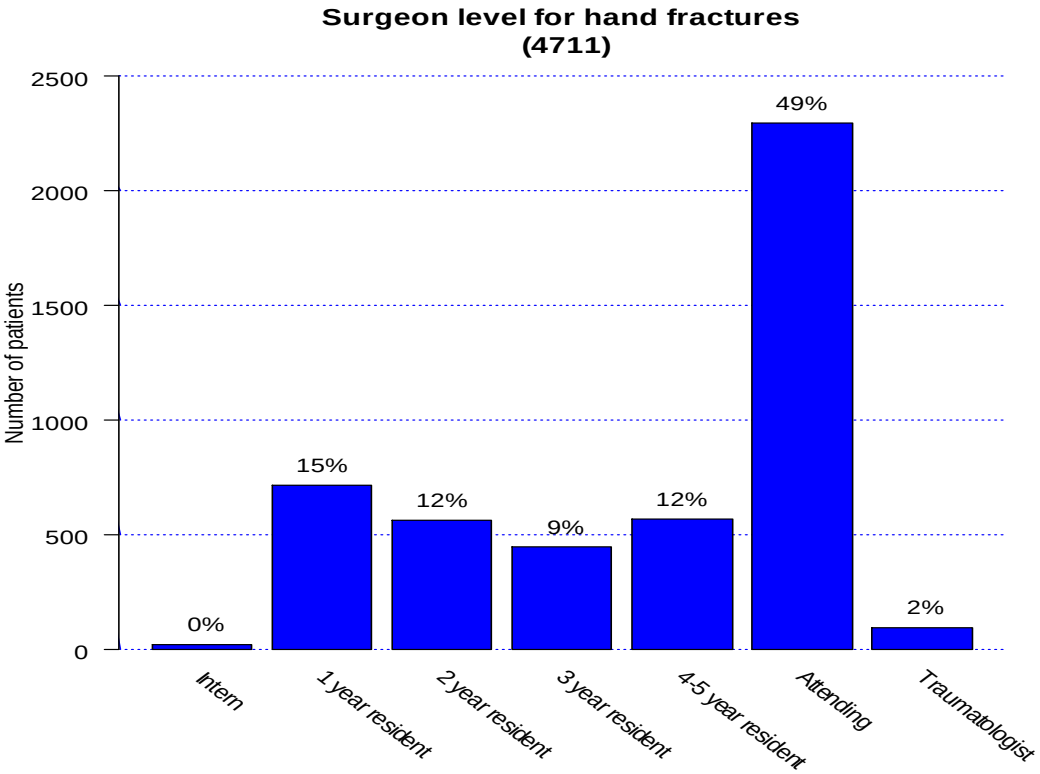

Surgeon level for distal radius fractures
(9425)
Number of patients
4000
3000
2000
1000
0
0%
22%
16%
11%
13%
37%
2%
Intern
1 year resident
2 year resident
3 year resident
4-5 year resident
Attending
Traumatologist

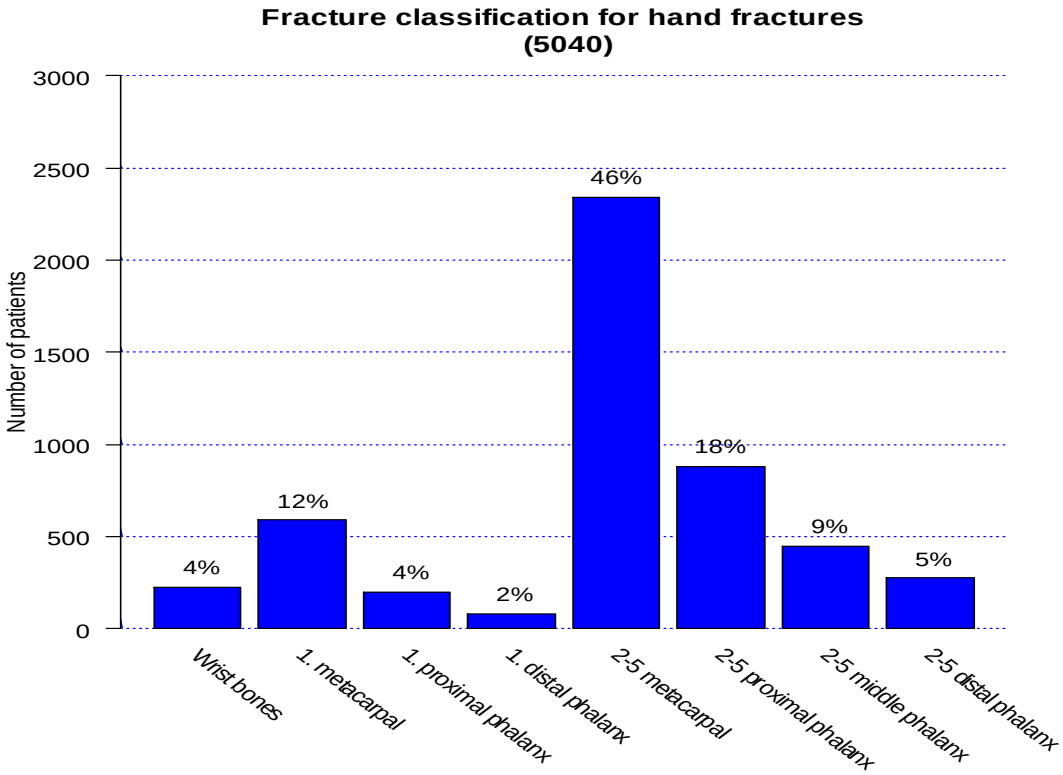


Hand

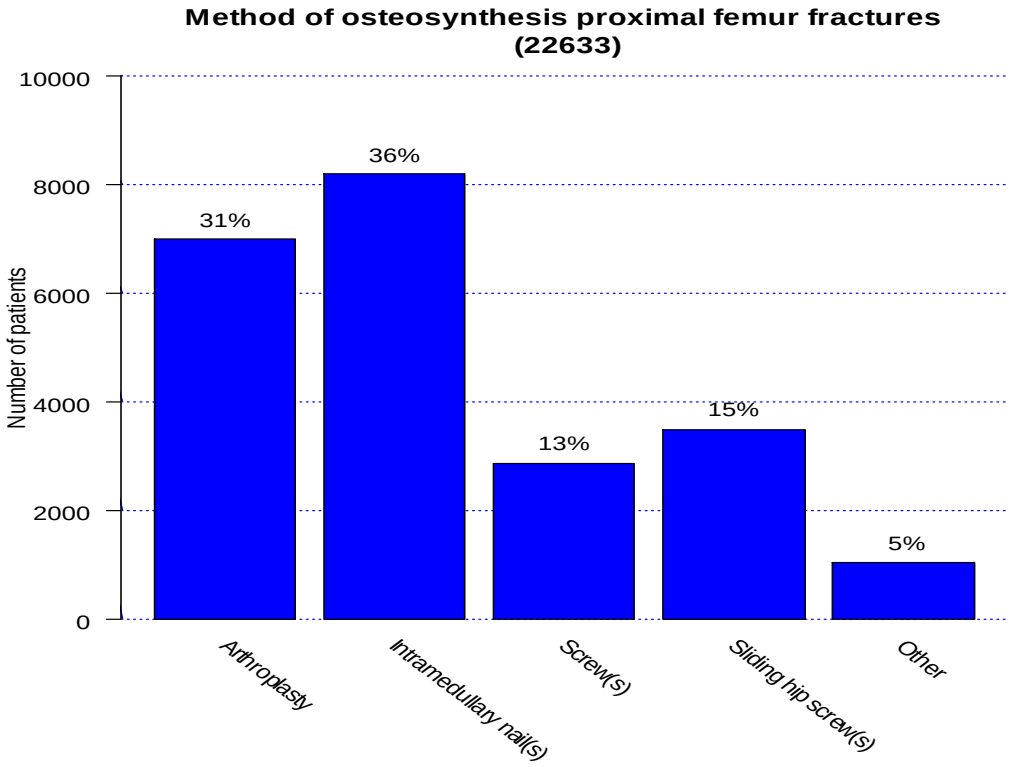

Method of osteosynthesis hand fractures
(4989)
Number of patients
5000
4000
3000
2000
1000
0
81%
9%
10%
K-wire(s)
Screw(s)
Other

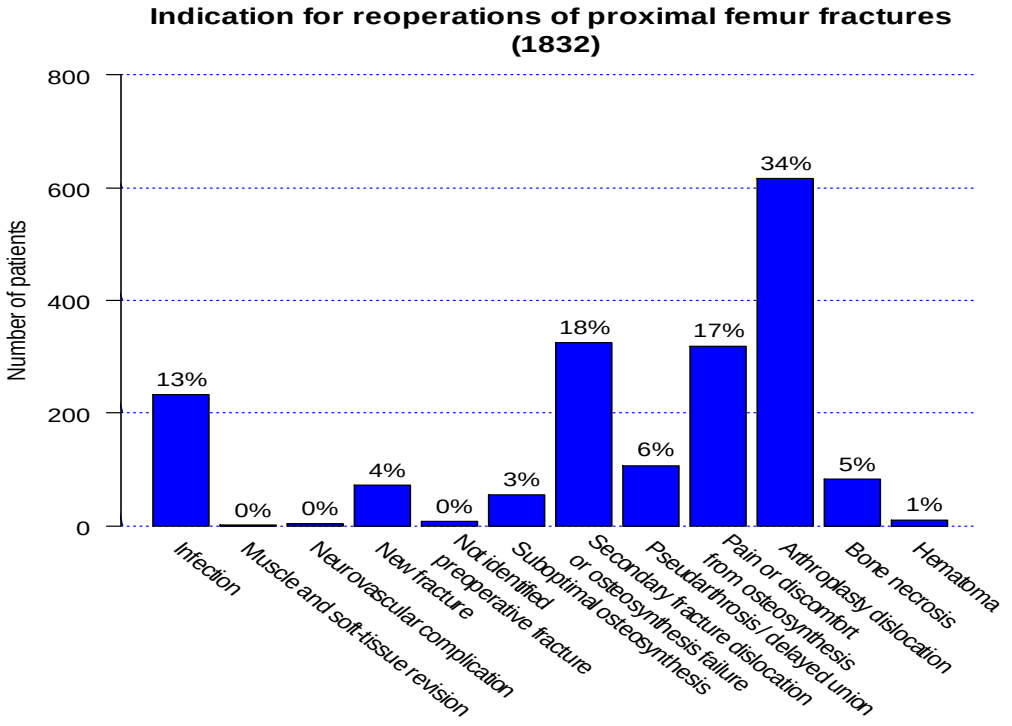

Indication for reoperations of hand fractures
(178)
Number of patients
80
60
40
20
0
12%
3%
1%
5%
16%
33%
10%
20%
2%
Infection
Muscle and soft-tissue revision
Neurovascular complication
New fracture
Suboptimal osteosynthesis
Secondary fracture dislocation or osteosynthesis failure
Pseudarthrosis / delayed union
Pain or discomfort from osteosynthesis
Bone necrosis

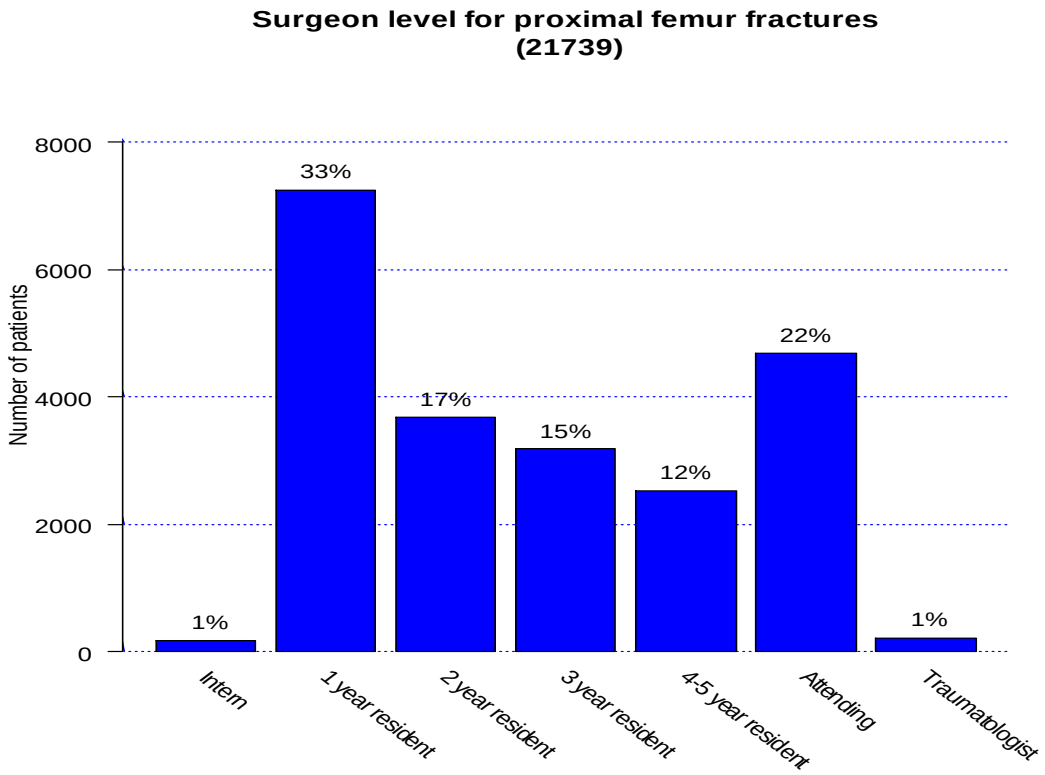

Surgeon level for hand fractures
(4711)
Number of patients
2500
2000
1500
1000
500
0
0%
15%
12%
9%
12%
49%
2%
Intern
1 year resident
2 year resident
3 year resident
4-5 year resident
Attending
Traumatologist

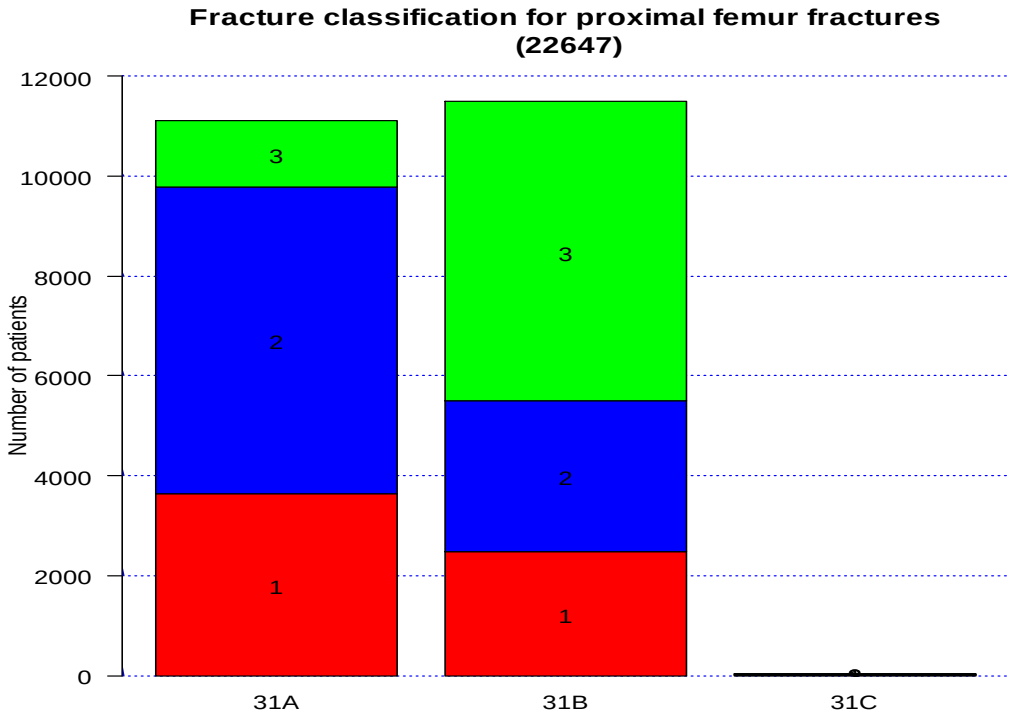

Fracture classification for hand fractures
(5040)
Number of patients
3000
2500
2000
1500
1000
500
0
4%
12%
4%
2%
46%
18%
9%
5%
Wrist bones
1. metacarpal
1. proximal phalanx
1. distal phalanx
2-5 metacarpal
2-5 proximal phalanx
2-5 middle phalanx
2-5 distal phalanx

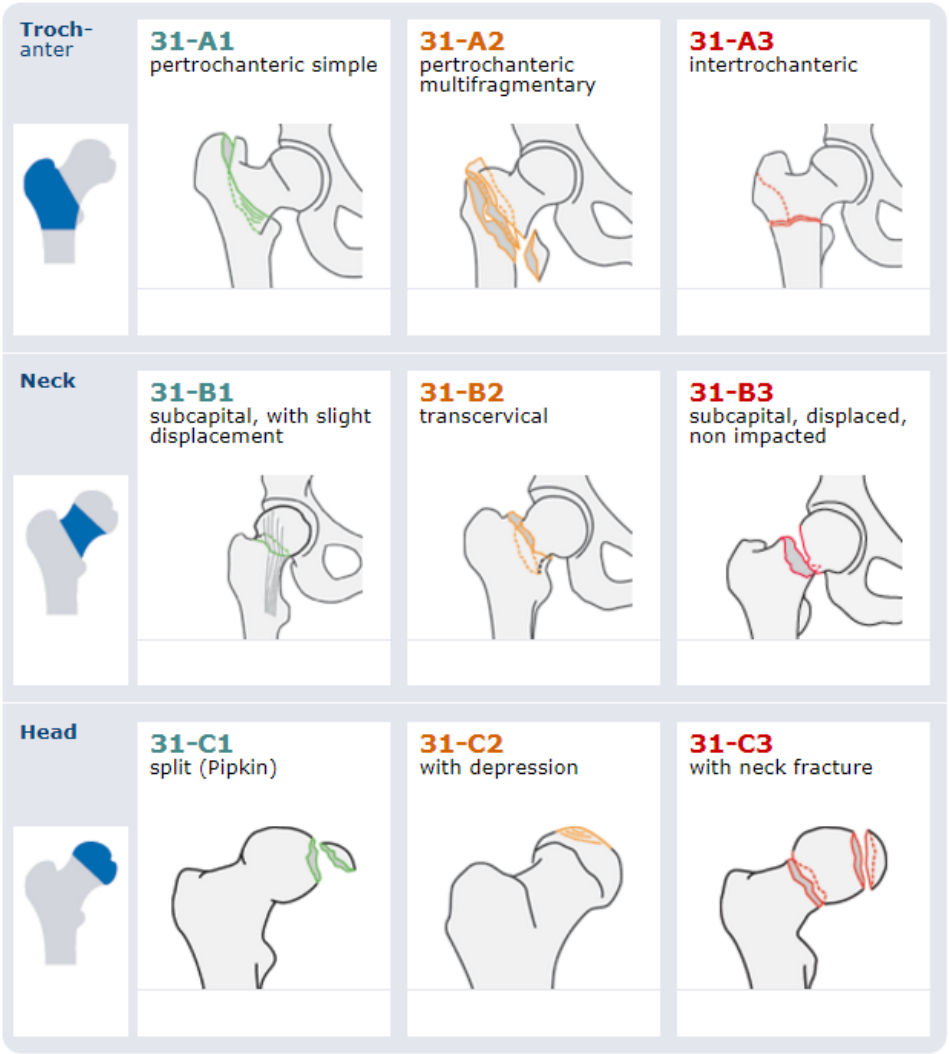
Proximal femur



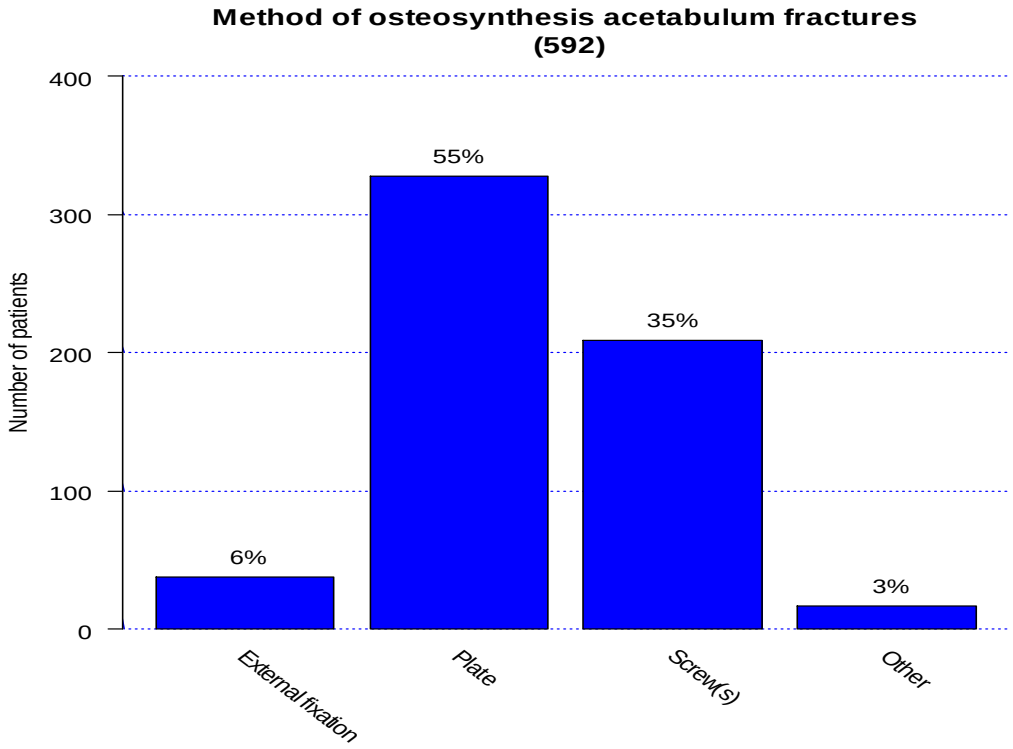


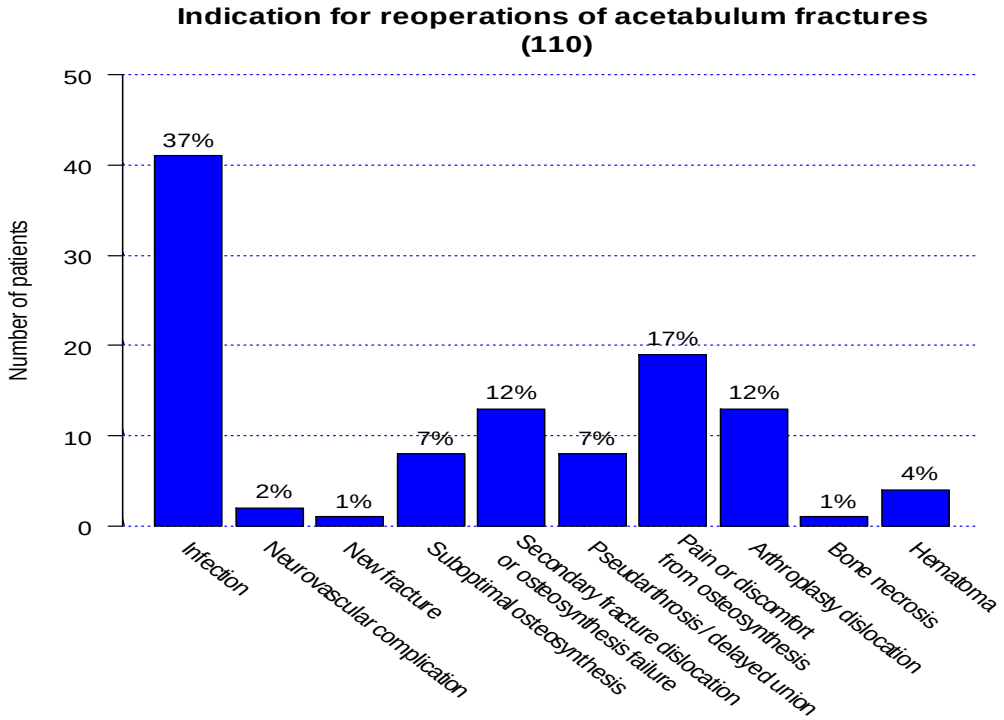

Surgeon level for proximal femur fractures
(21739)
Number of patients
8000
6000
4000
2000
0
1%
33%
17%
15%
12%
22%
1%
Intern
1 year resident
2 year resident
3 year resident
4-5 year resident
Attending
Traumatologist

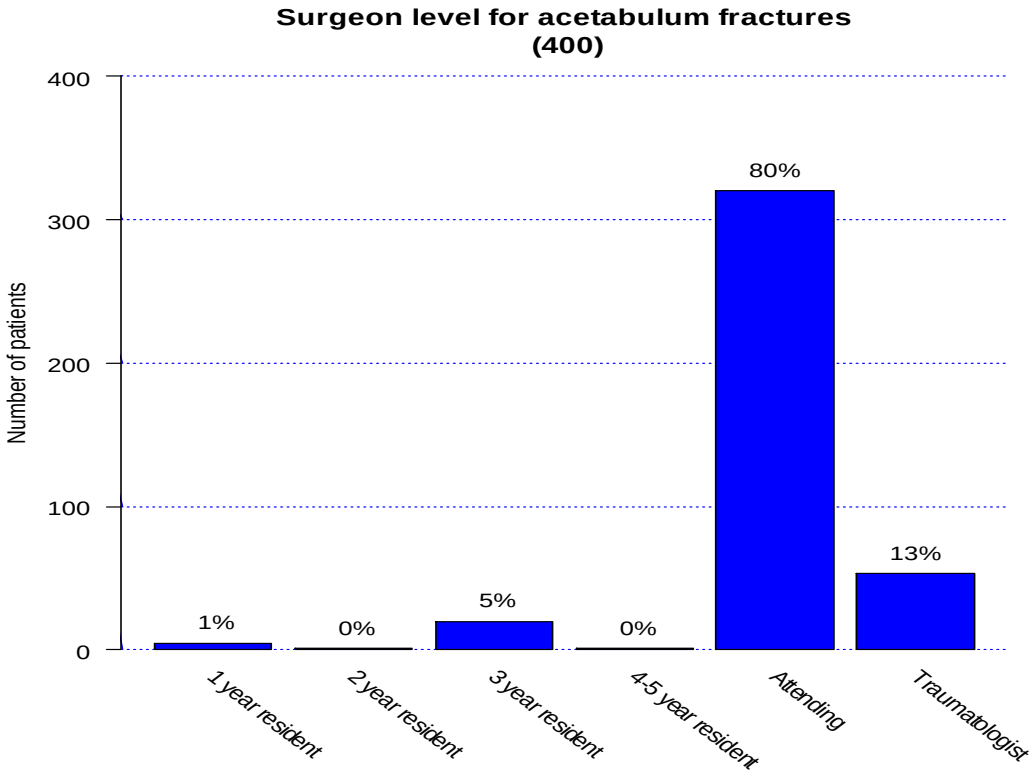


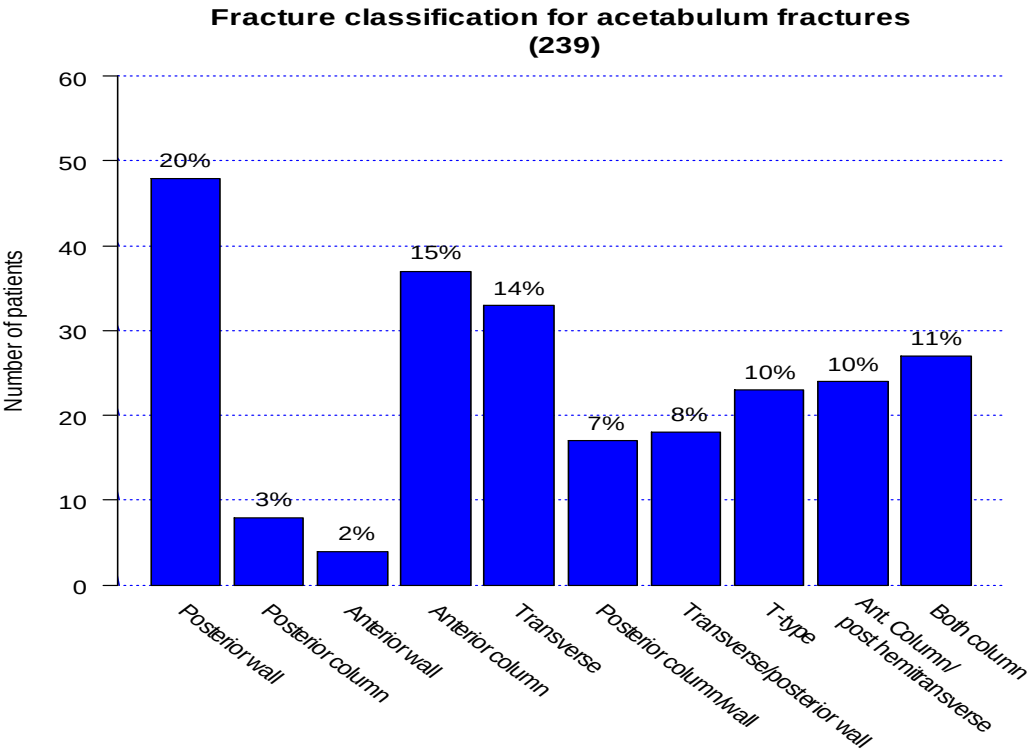


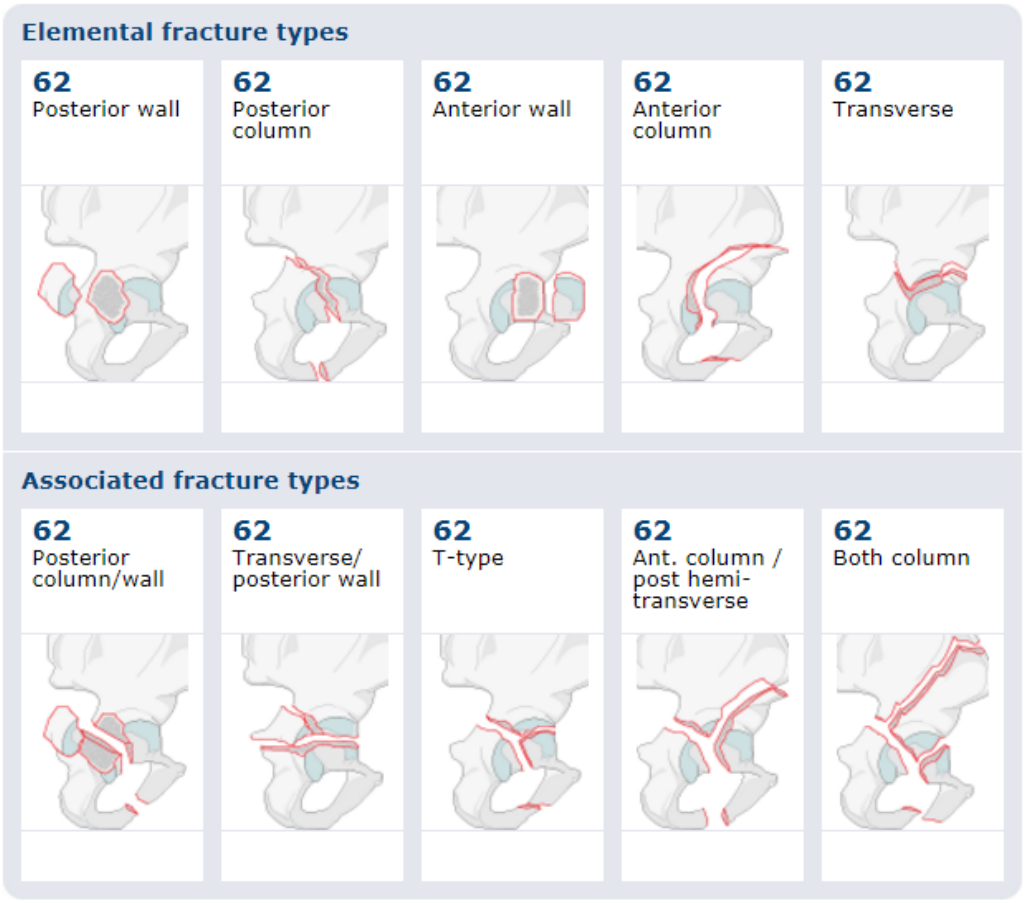
Acetabulum


Method of osteosynthesis acetabulum fractures
(592)
Number of patients
400
300
200
100
0
6%
55%
35%
3%
External fixation
Plate
Screw(s)
Other

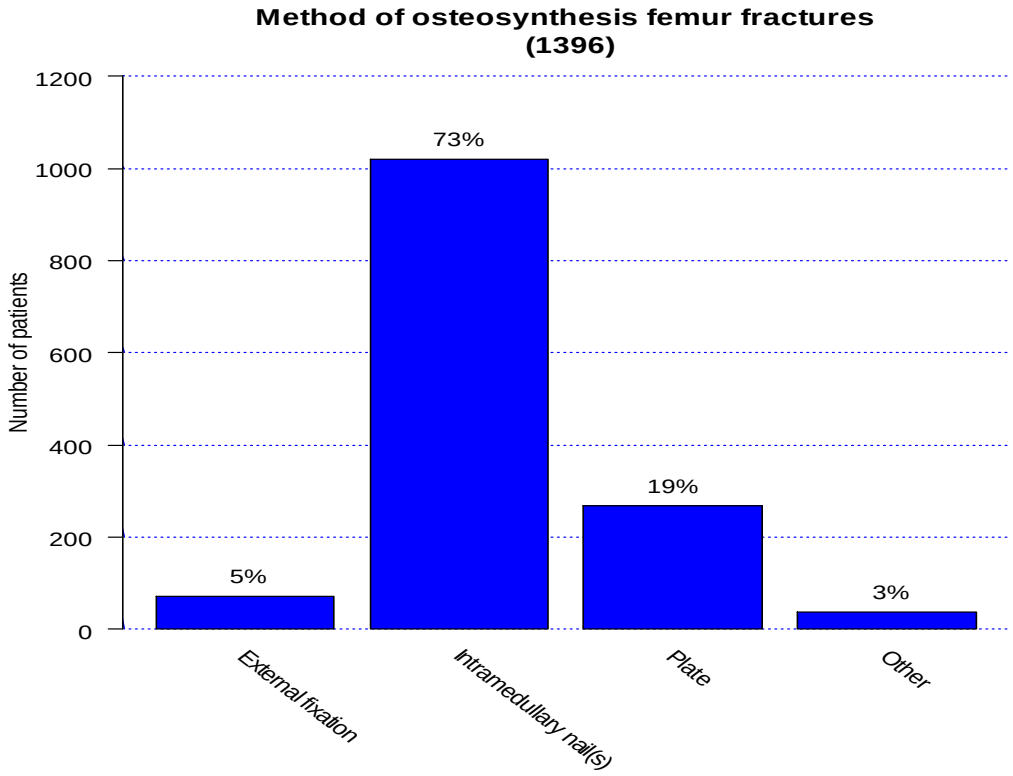

Indication for reoperations of acetabulum fractures
(110)
Number of patients
50
40
30
20
10
0
37%
2%
1%
7%
12%
7%
17%
12%
1%
4%
Infection
Neurovascular complication
New fracture
Suboptimal osteosynthesis
Secondary fracture dislocation or osteosynthesis failure
Pseudarthrosis / delayed union
Pain or discomfort from osteosynthesis
Arthroplasty dislocation
Bone necrosis
Hematoma

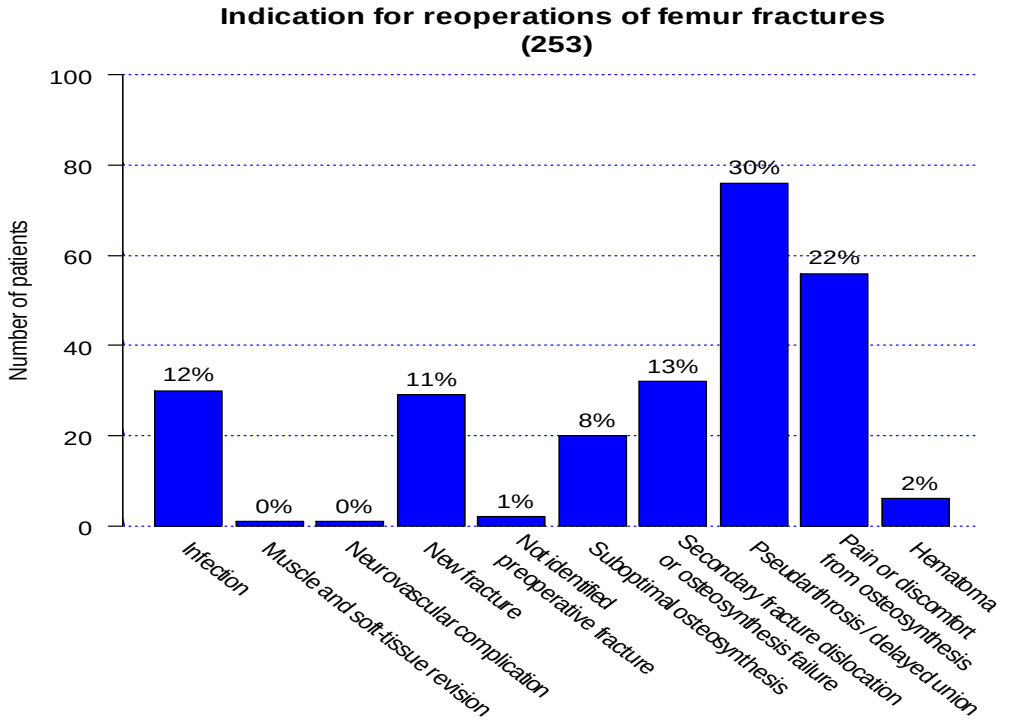

Surgeon level for acetabulum fractures
(400)
Number of patients
400
300
200
100
0
1%
0%
5%
0%
80%
13%
1 year resident
2 year resident
3 year resident
4-5 year resident
Attending
Traumatologist

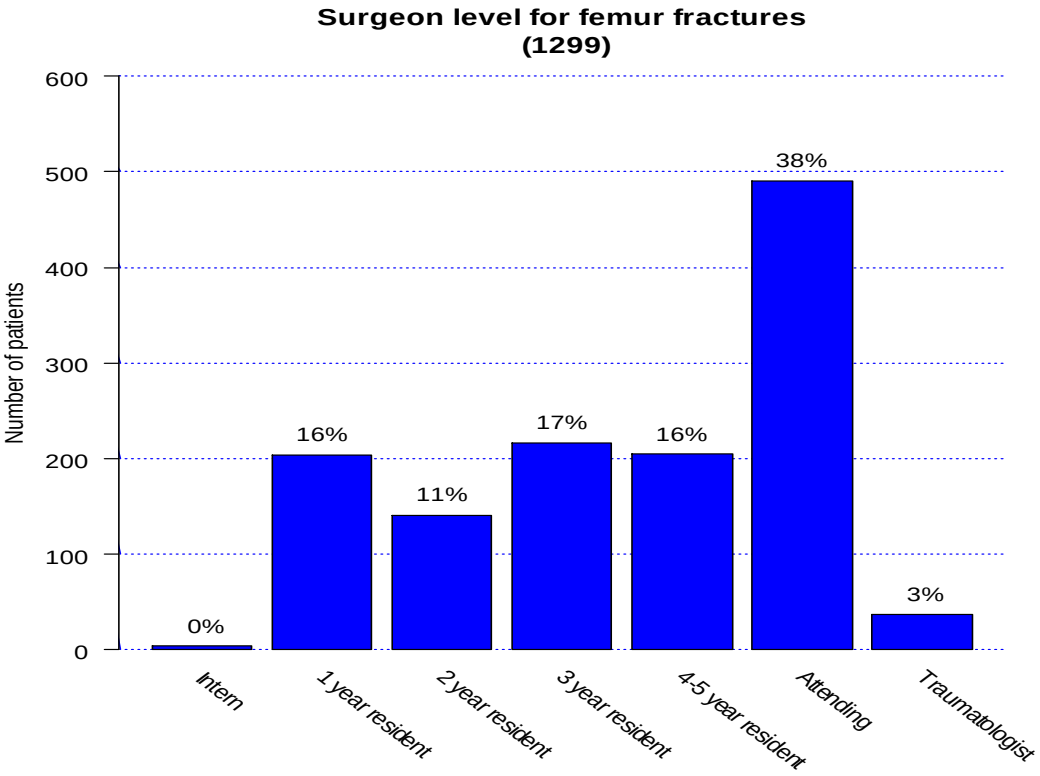


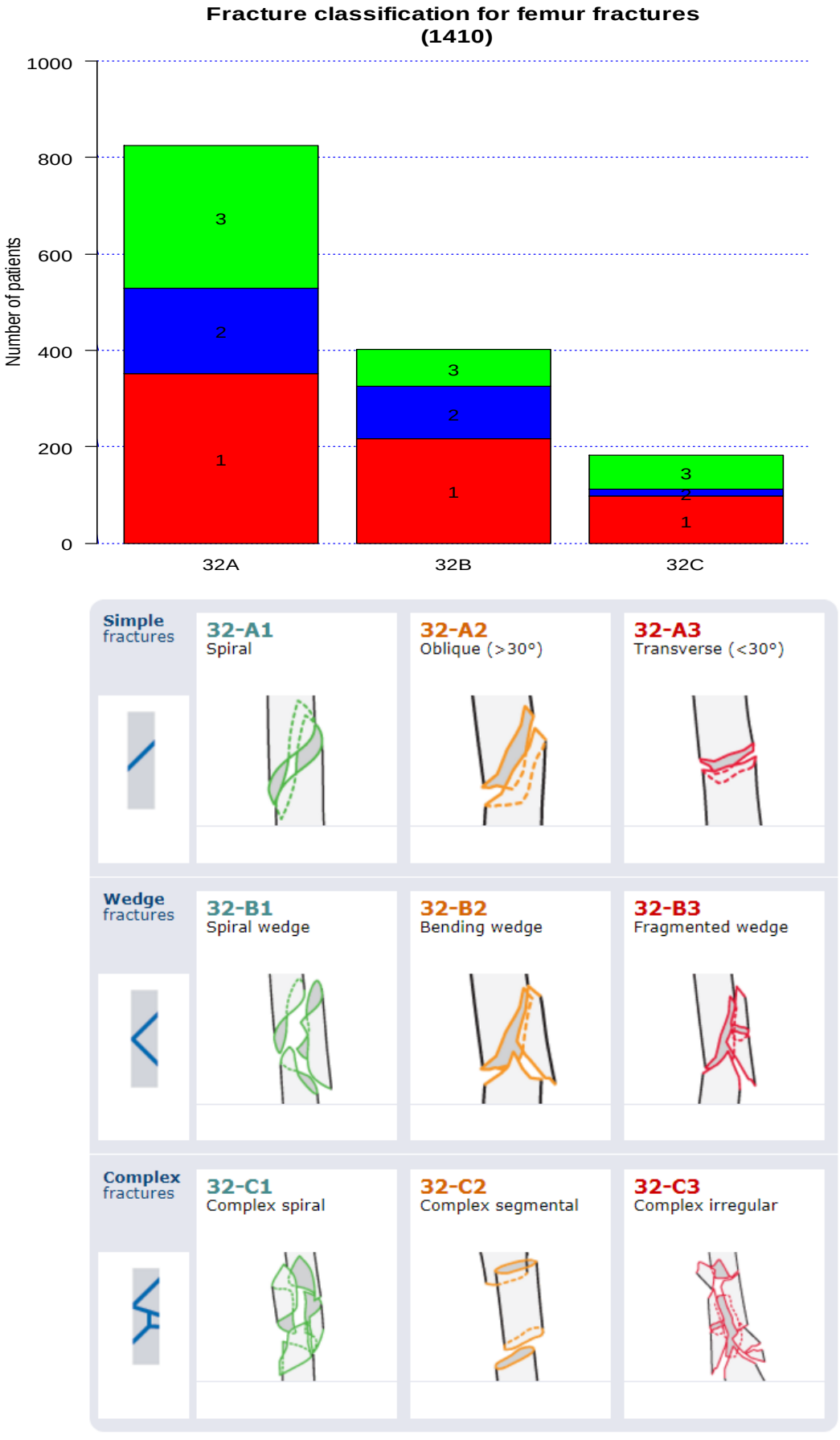


Femur

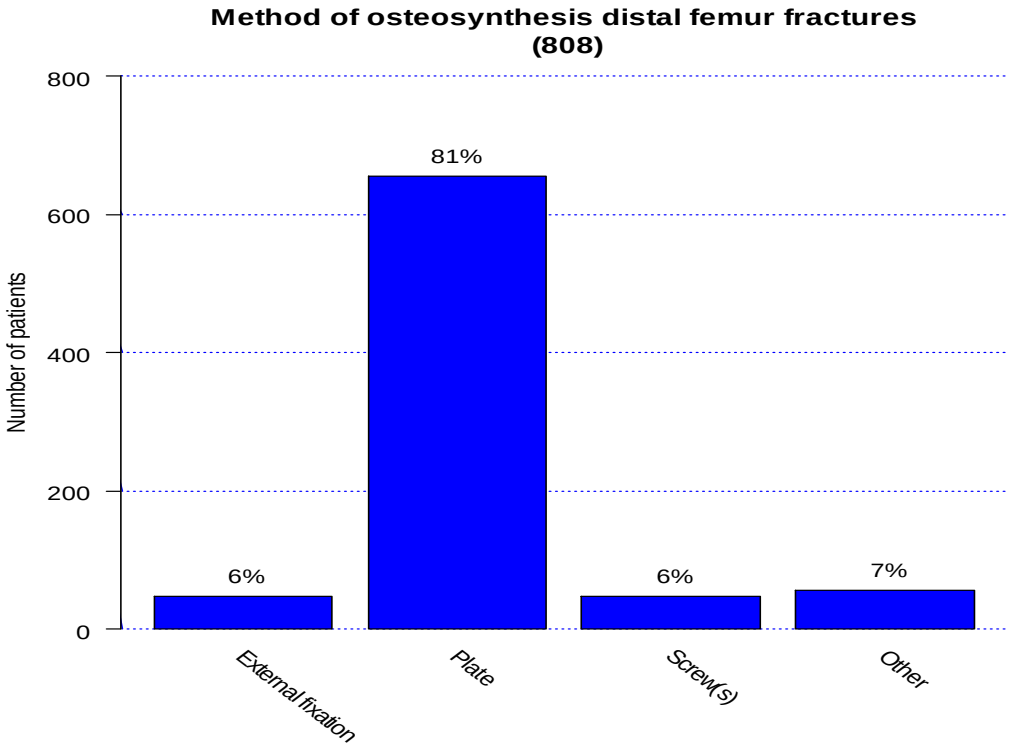

Method of osteosynthesis femur fractures
(1396)
Number of patients
1200
1000
800
600
400
200
0
73%
19%
5%
3%
External fixation
Intramedullary nail(s)
Plate
Other

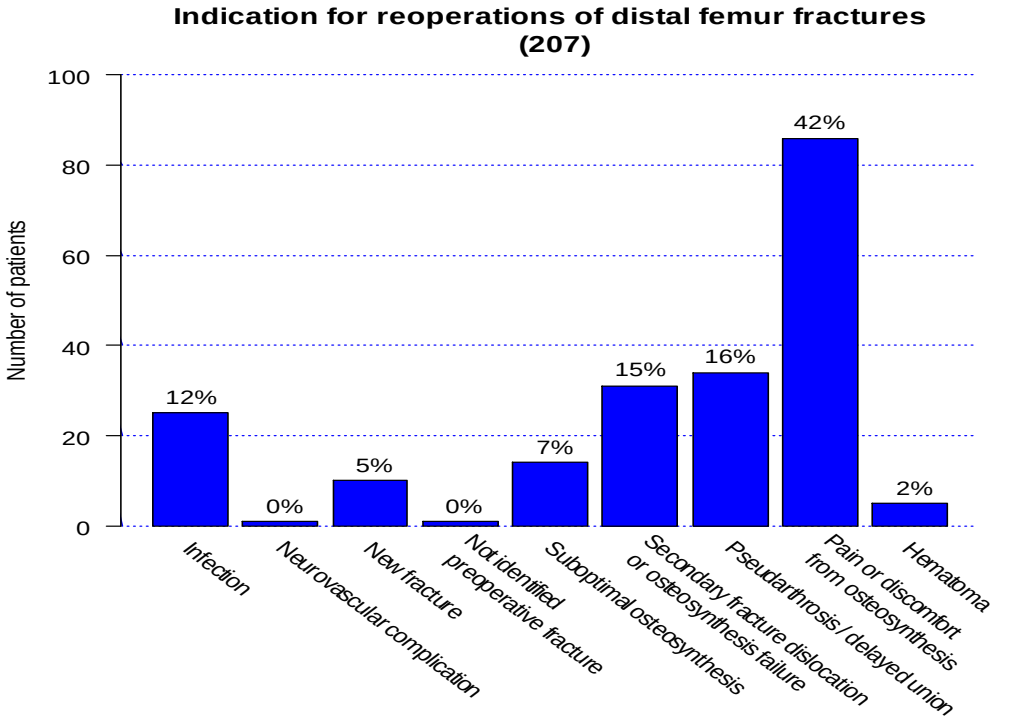

Indication for reoperations of femur fractures
(253)
Number of patients
100
80
60
40
20
0
12%
0%
0%
11%
1%
8%
13%
30%
22%
2%
Infection
Muscle and soft-tissue revision
Neurovascular complication
New fracture
Not identified preoperative fracture
Suboptimal osteosynthesis
Secondary fracture dislocation or osteosynthesis failure
Pseudarthrosis / delayed union
Pain or discomfort from osteosynthesis
Hematoma

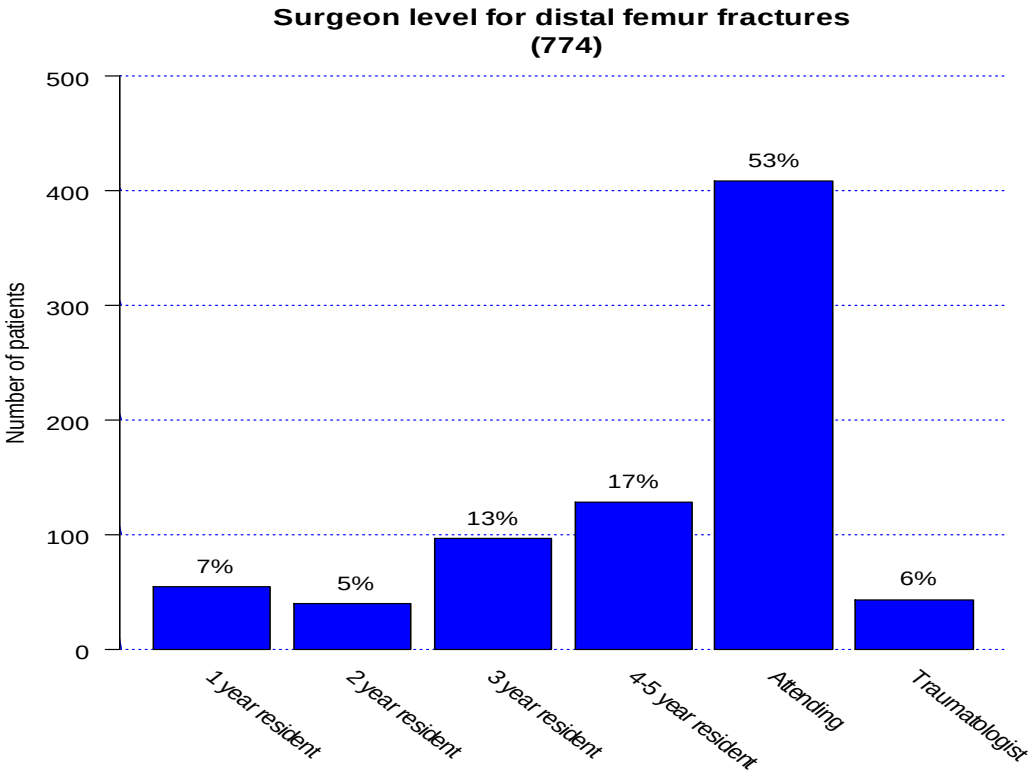

Surgeon level for femur fractures
(1299)
Number of patients
600
500
400
300
200
100
0
0%
16%
11%
17%
16%
38%
3%
Intern
1 year resident
2 year resident
3 year resident
4-5 year resident
Attending
Traumatologist

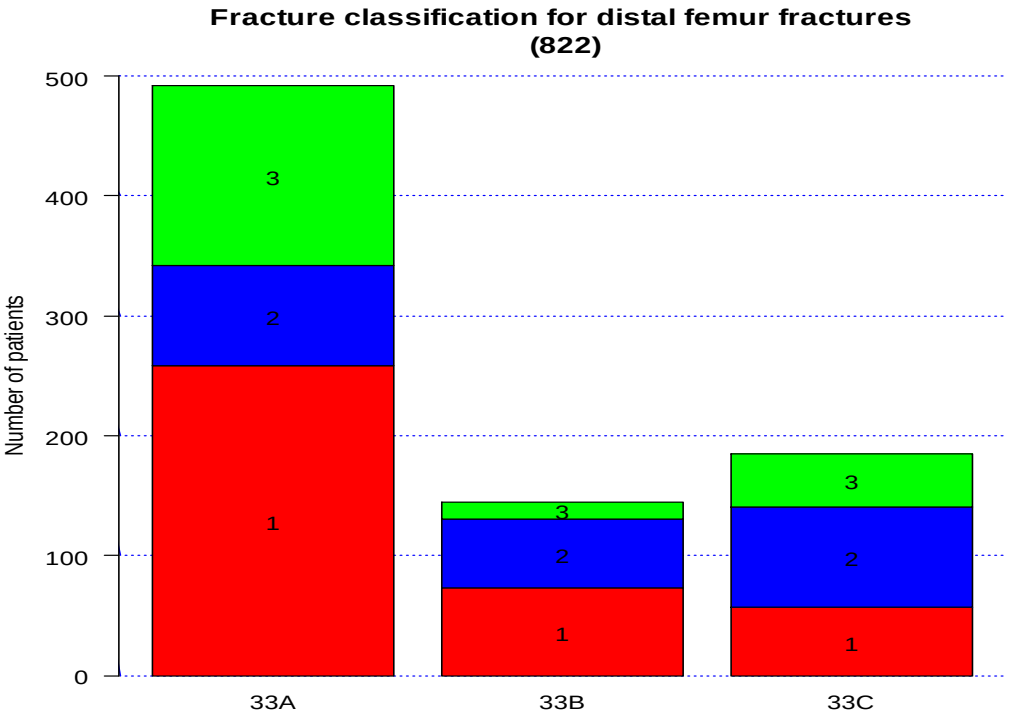


Distal femur

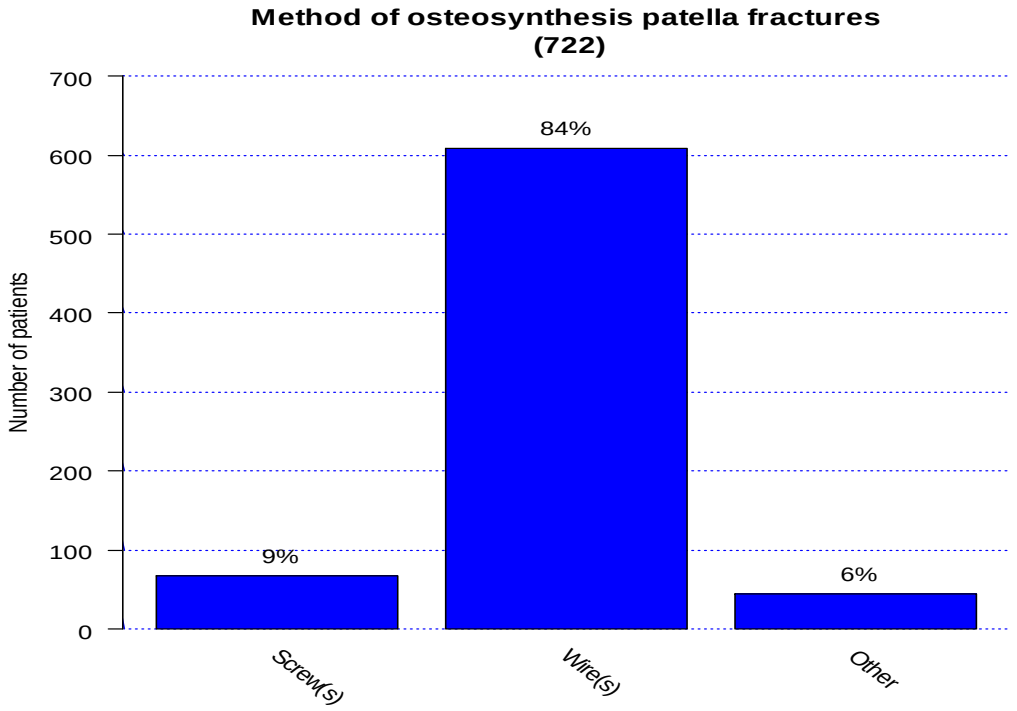


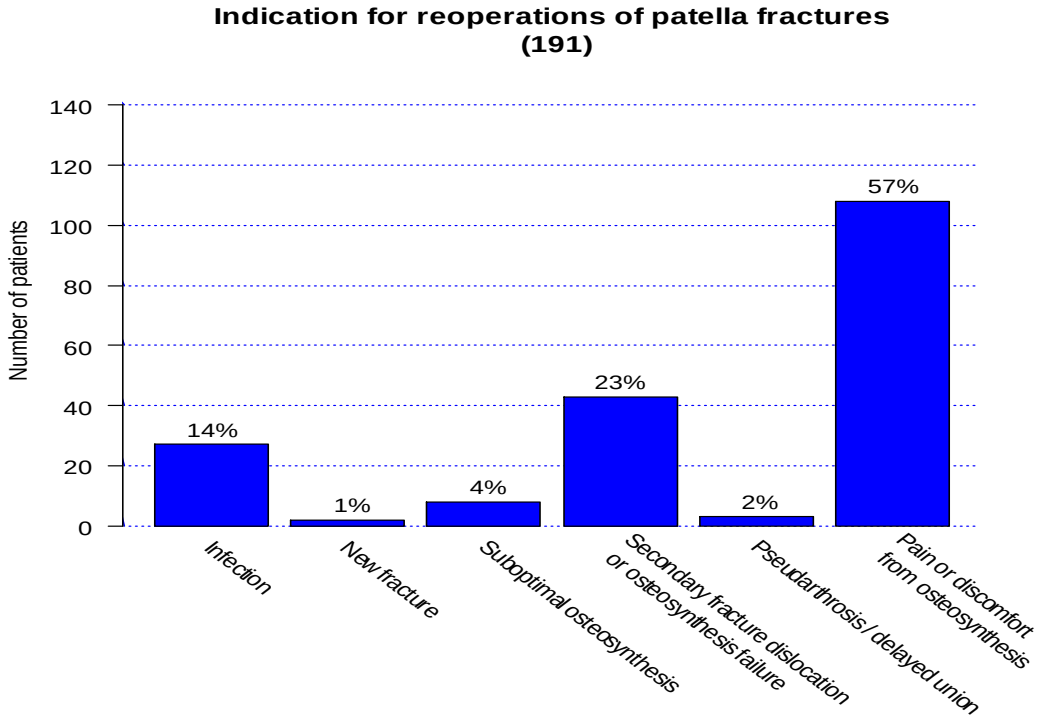


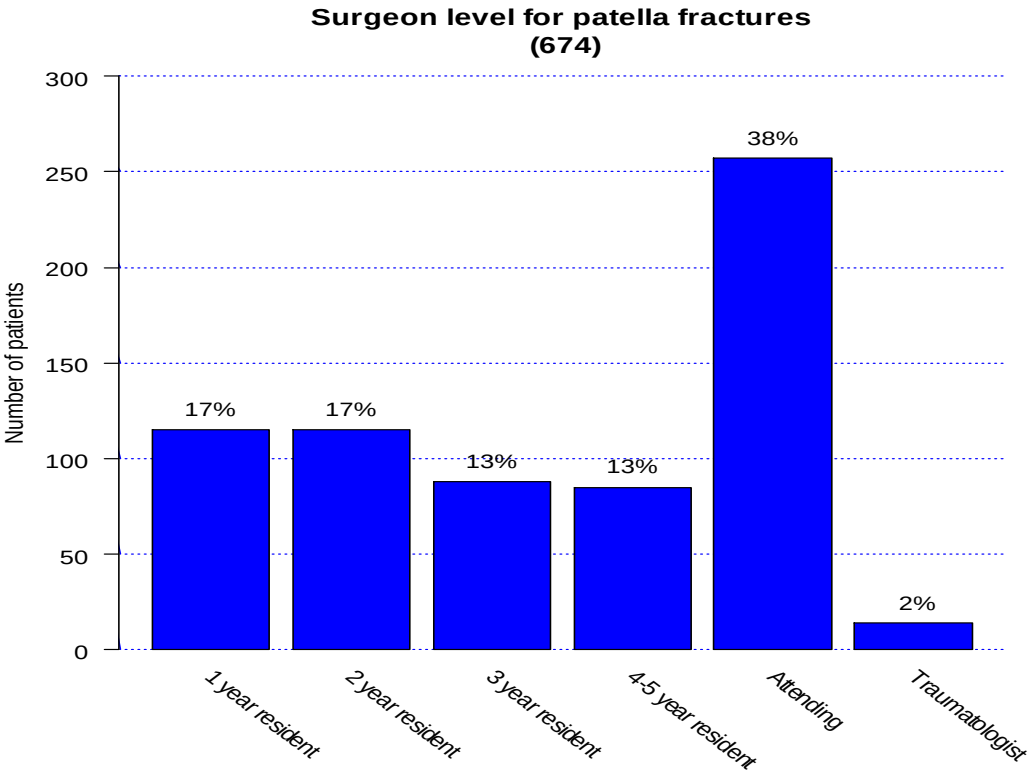

Surgeon level for distal femur fractures
(774)
Number of patients
500
400
300
200
100
0
7%
5%
13%
17%
53%
6%
1 year resident
2 year resident
3 year resident
4-5 year resident
Attending
Traumatologist

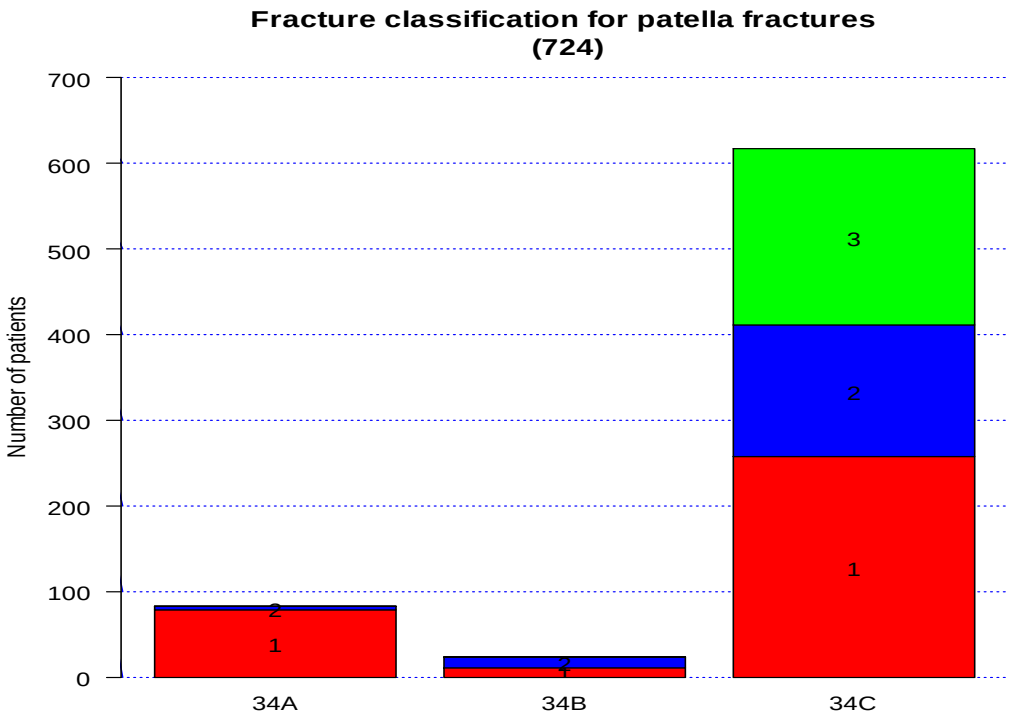


Patella

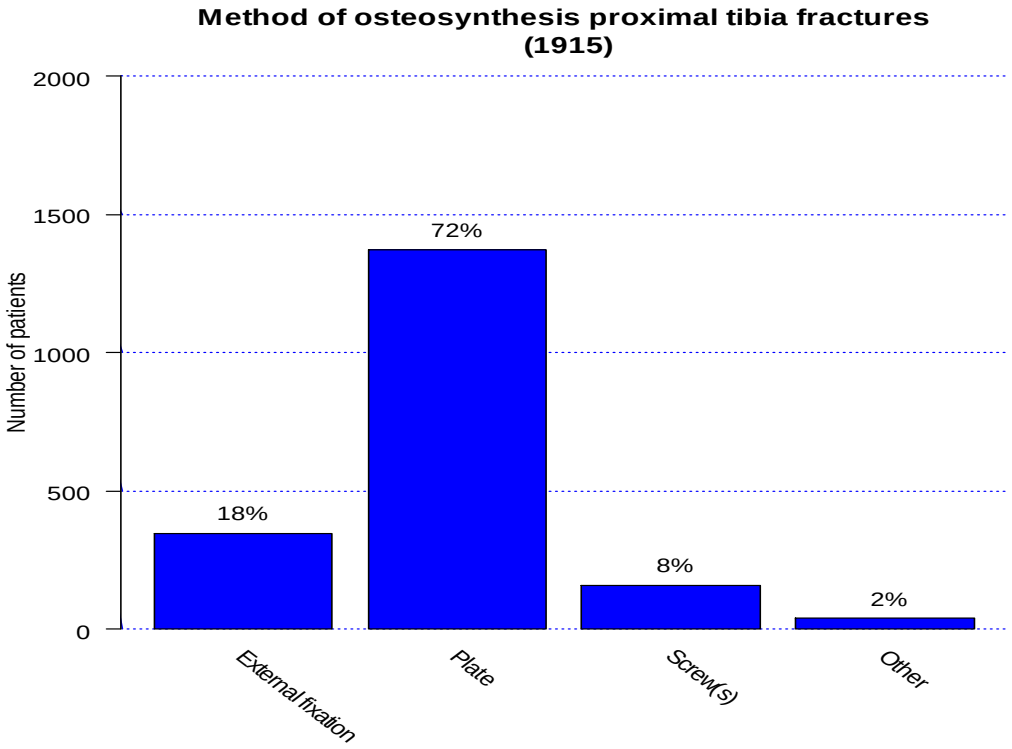

Method of osteosynthesis patella fractures
(722)
Number of patients
700
600
500
400
300
200
100
0
84%
9%
6%
Screw(s)
Wire(s)
Other

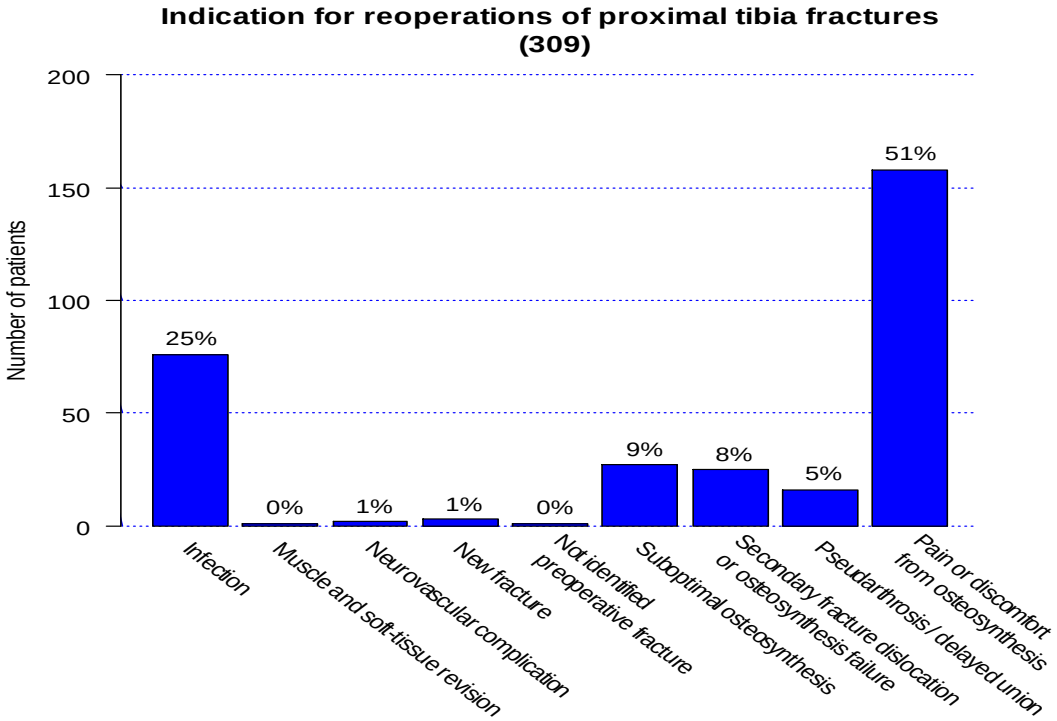

Indication for reoperations of patella fractures
(191)
Number of patients
140
120
100
80
60
40
20
0
14%
1%
4%
23%
2%
57%
Infection
New fracture
Suboptimal osteosynthesis
Secondary fracture dislocation or osteosynthesis failure
Pseudarthrosis / delayed union
Pain or discomfort from osteosynthesis

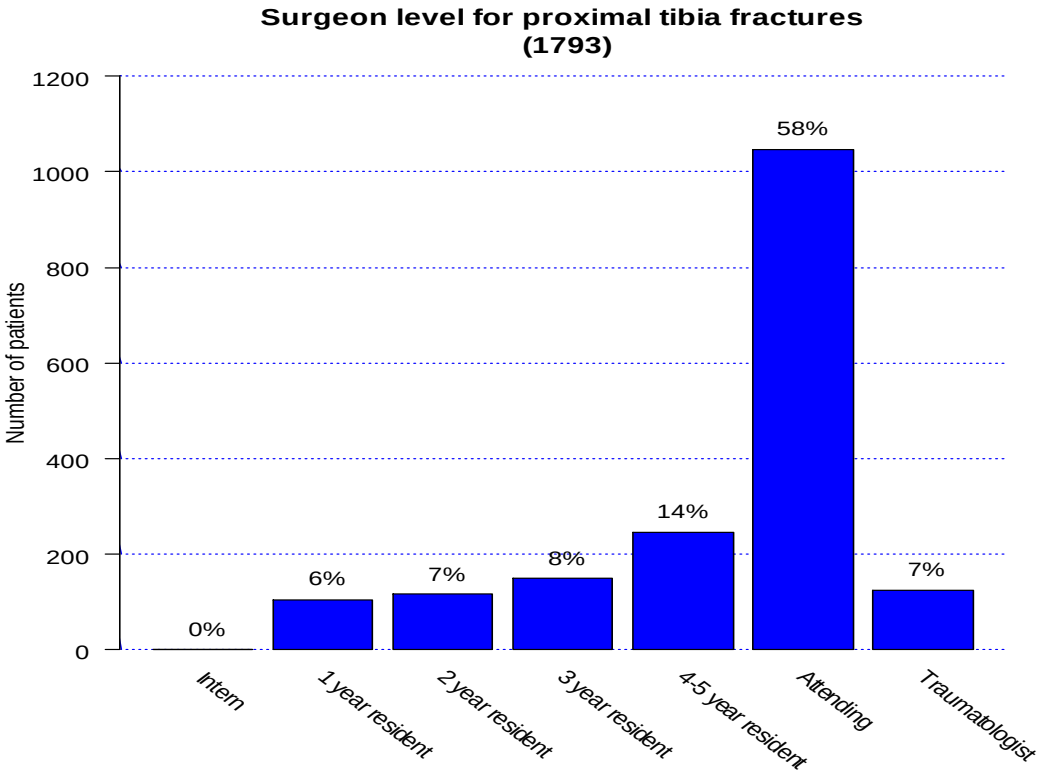

Surgeon level for patella fractures
(674)
Number of patients
300
250
200
150
100
50
0
17%
17%
13%
13%
38%
2%
1 year resident
2 year resident
3 year resident
4-5 year resident
Attending
Traumatologist

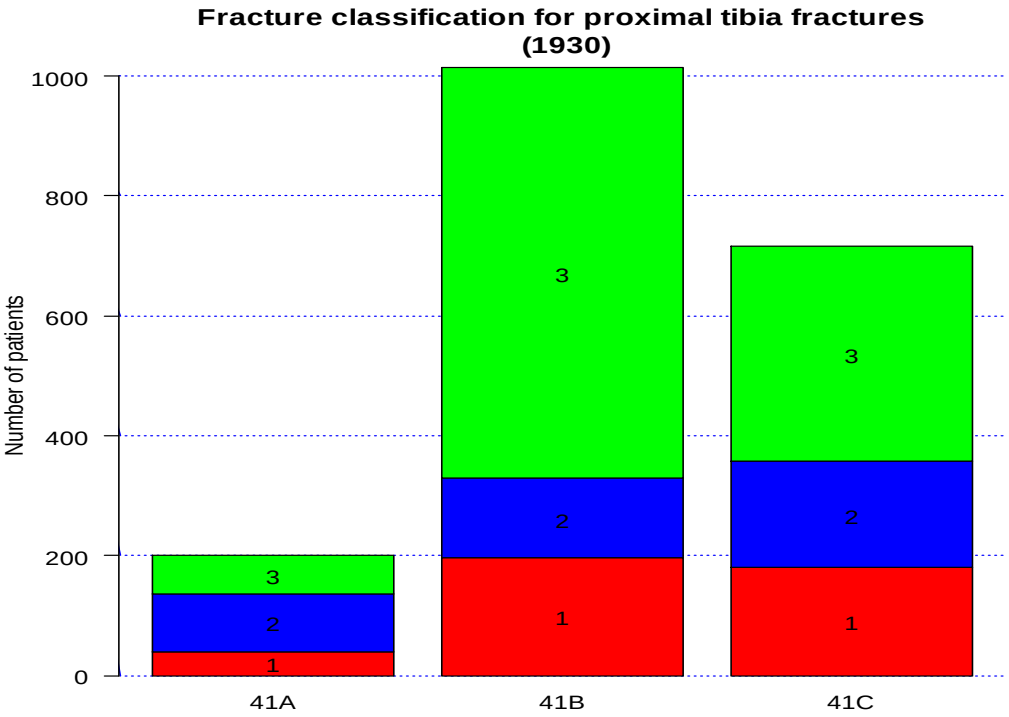


Proximal tibia

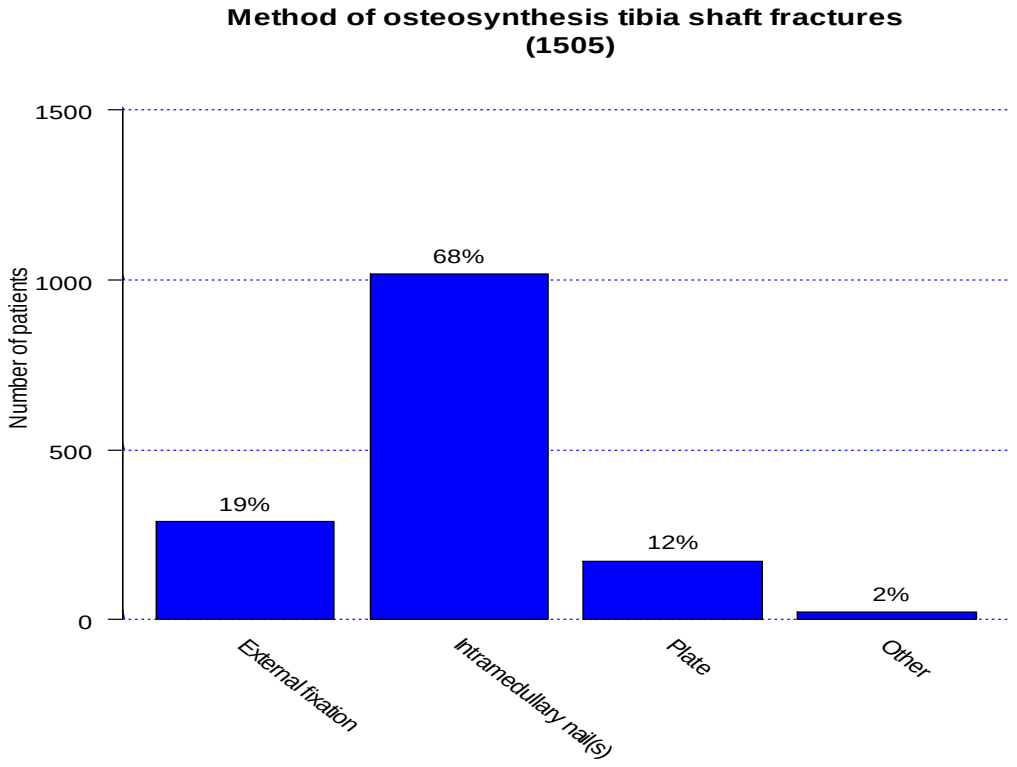


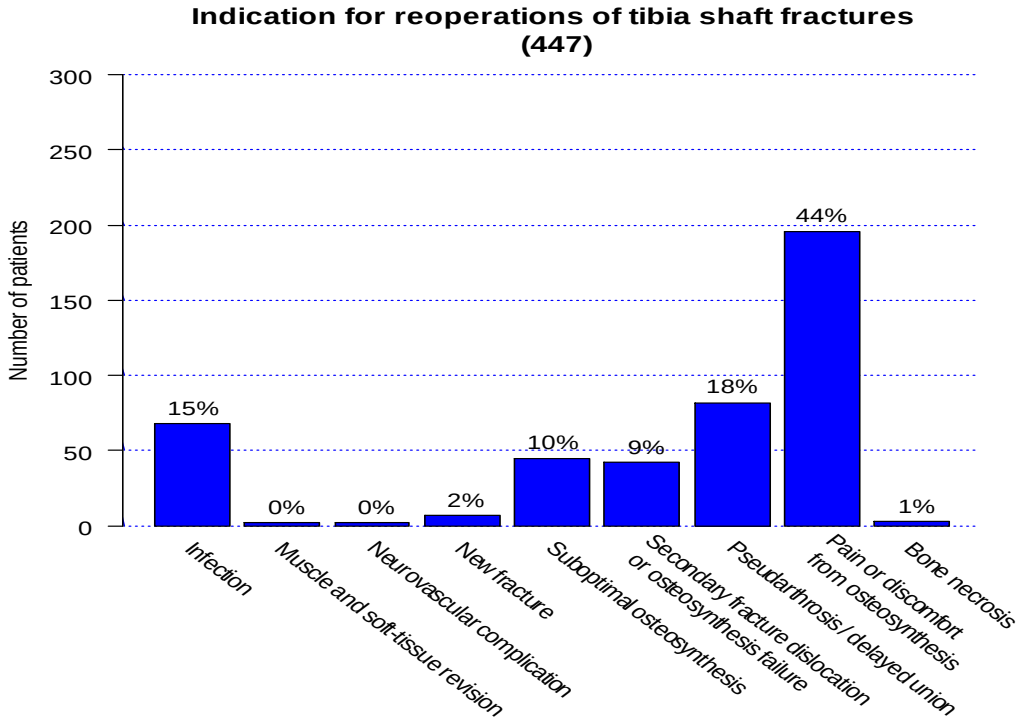


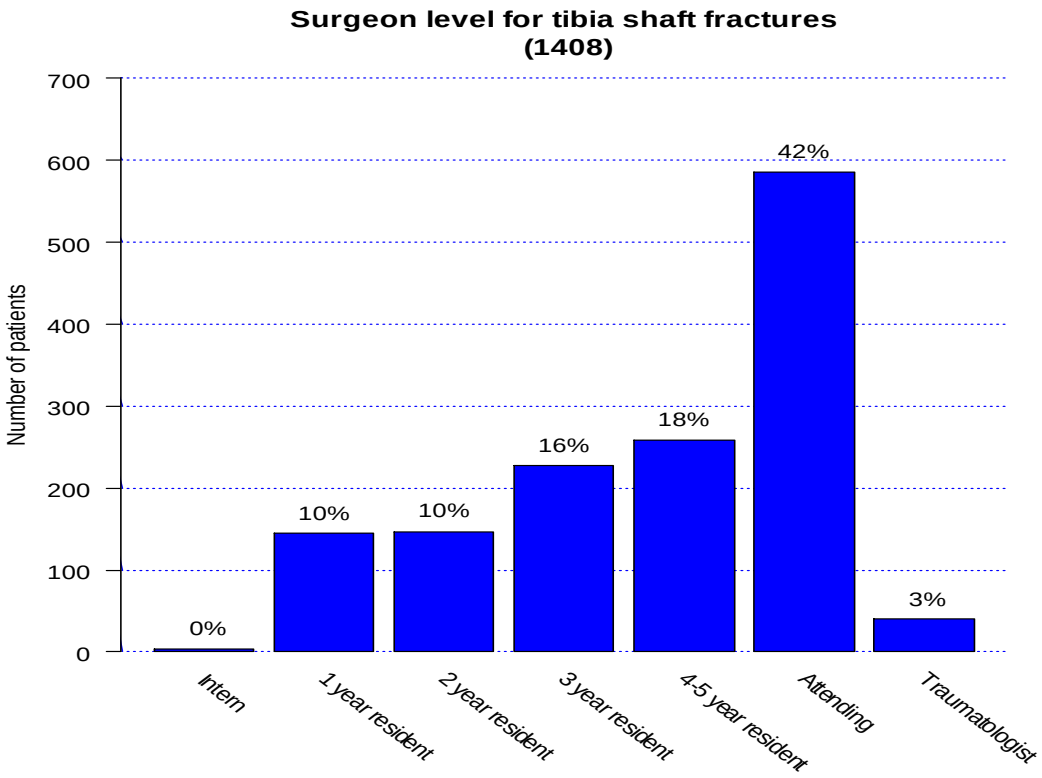

Surgeon level for proximal tibia fractures
(1793)
Number of patients
1200
1000
800
600
400
200
0
0%
6%
7%
8%
14%
58%
7%
Intern
1 year resident
2 year resident
3 year resident
4-5 year resident
Attending
Traumatologist

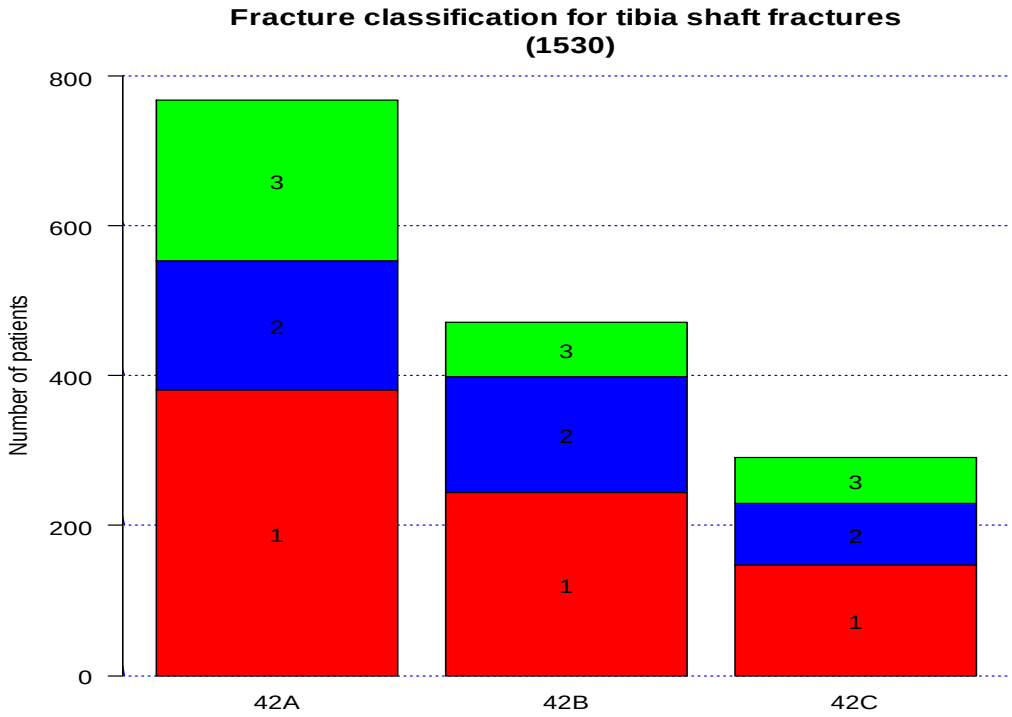


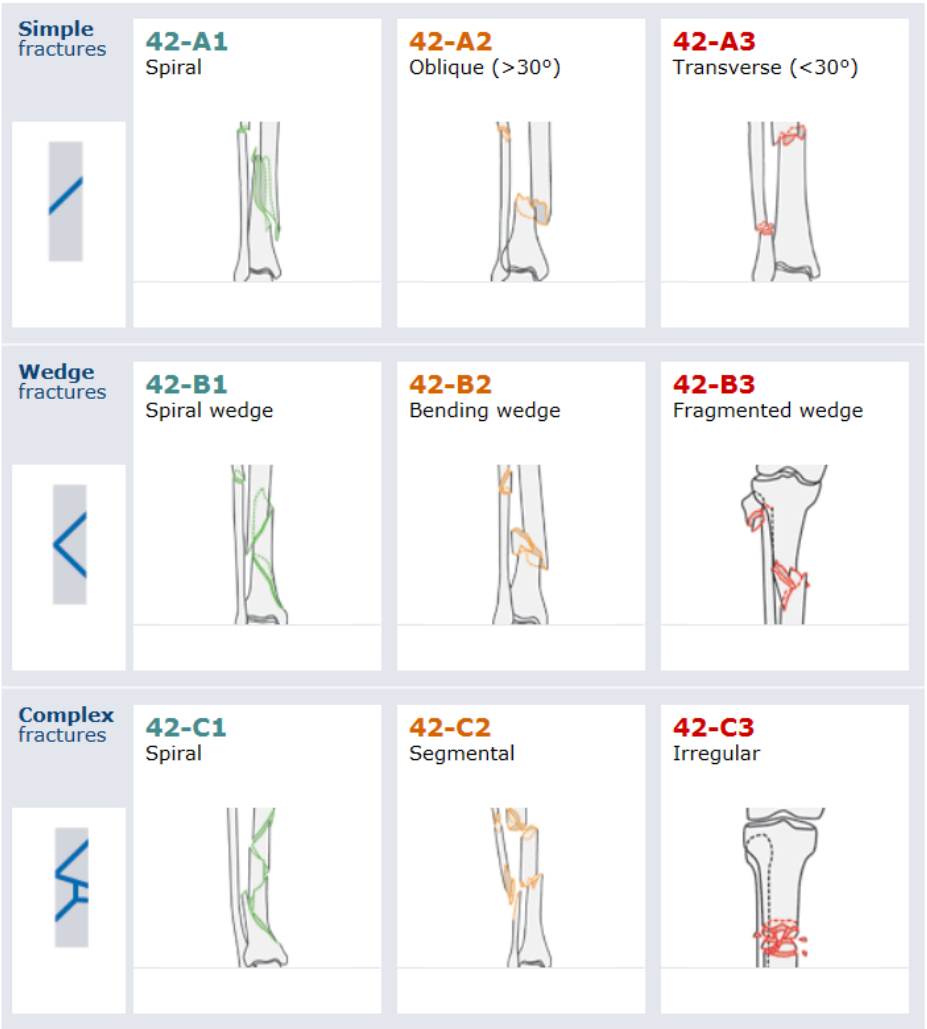
Tibia shaft


Method of osteosynthesis tibia shaft fractures
(1505)
Number of patients
1500
1000
500
0
19%
68%
12%
2%
External fixation
Intramedullary nail(s)
Plate
Other

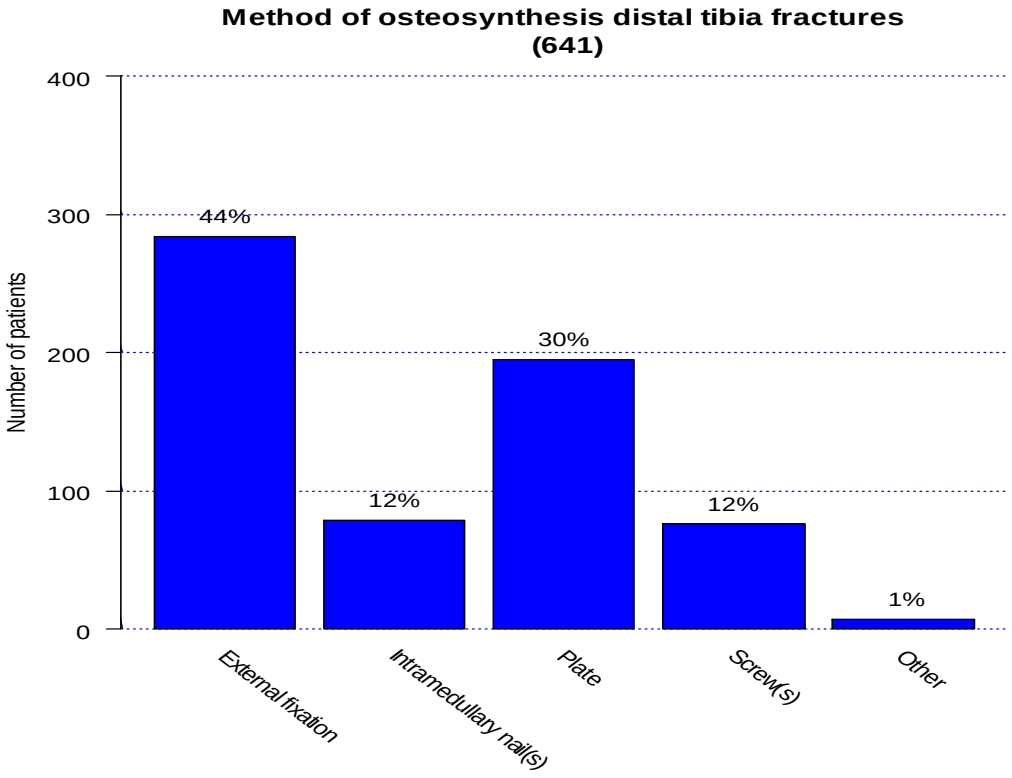

Indication for reoperations of tibia shaft fractures
(447)
Number of patients
300
250
200
150
100
50
0
15%
0%
0%
2%
10%
9%
18%
44%
1%
Infection
Muscle and soft-tissue revision
Neurovascular complication
New fracture
Suboptimal osteosynthesis
Secondary fracture dislocation or osteosynthesis failure
Pseudarthrosis / delayed union
Pain or discomfort from osteosynthesis
Bone necrosis

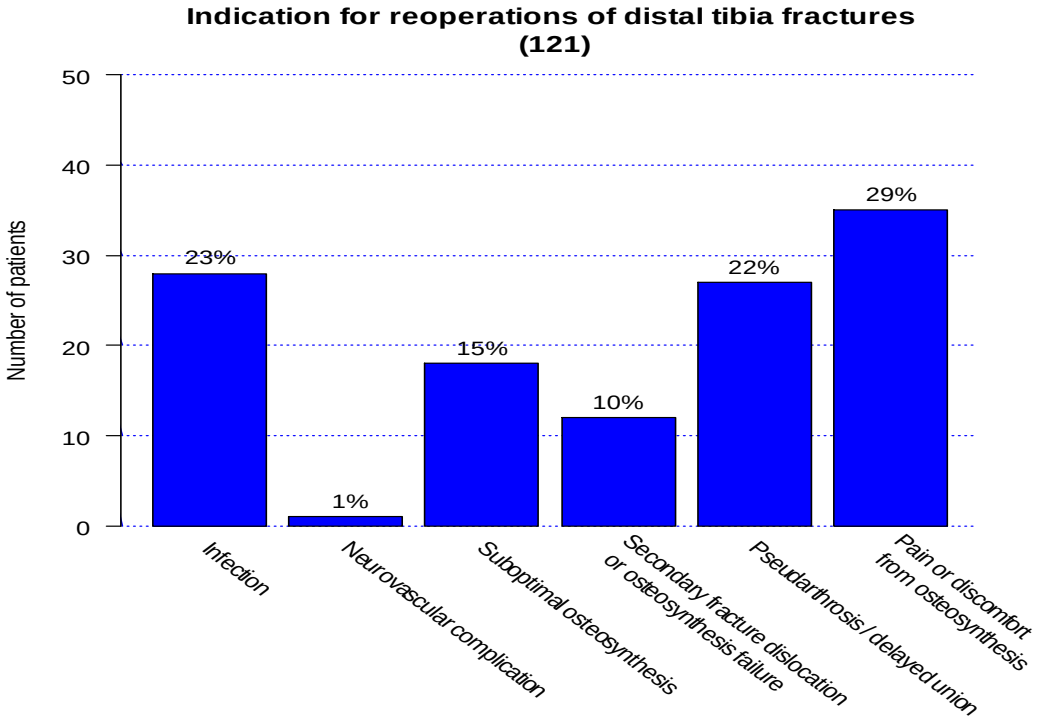

Surgeon level for tibia shaft fractures
(1408)
Number of patients
700
600
500
400
300
200
100
0
0%
10%
10%
16%
18%
42%
3%
Intern
1 year resident
2 year resident
3 year resident
4-5 year resident
Attending
Traumatologist

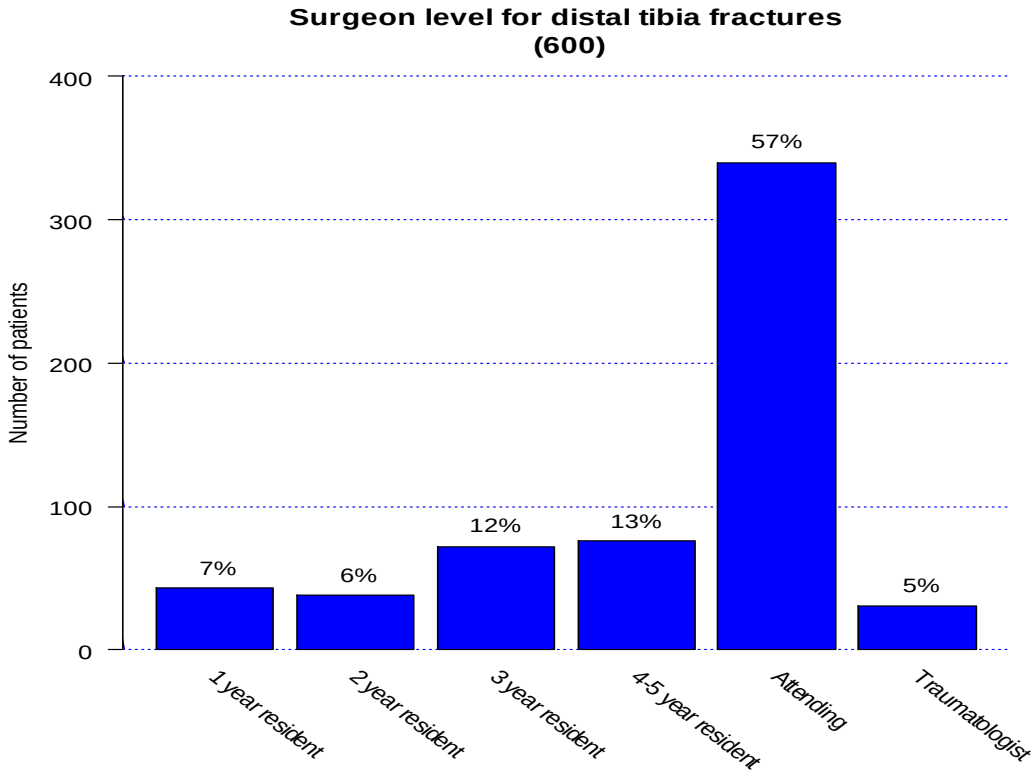


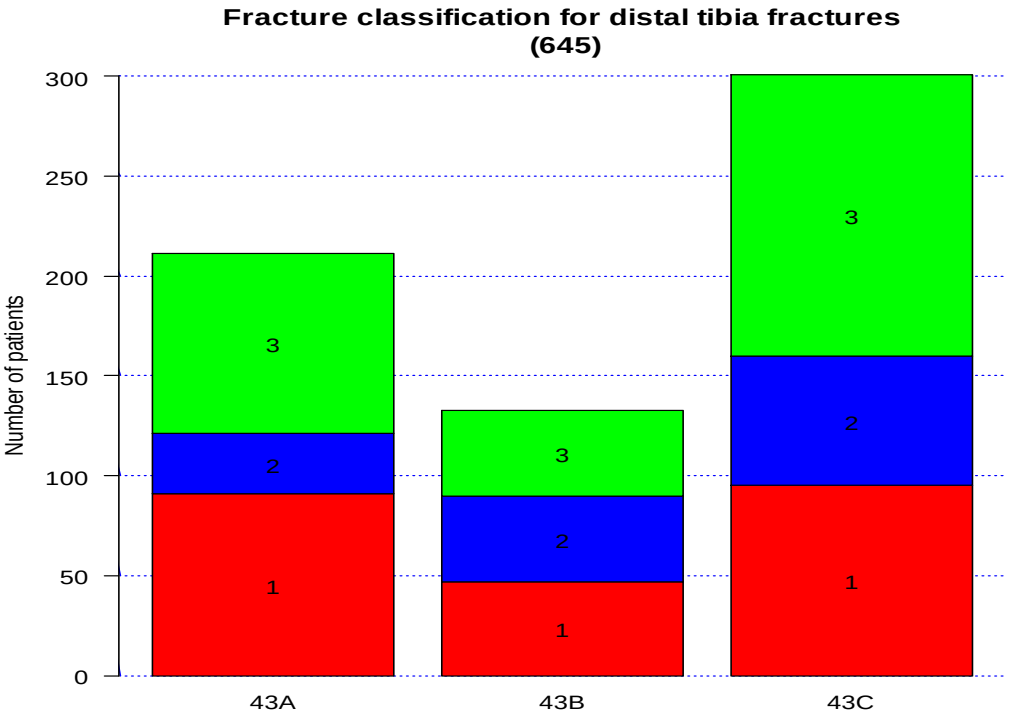


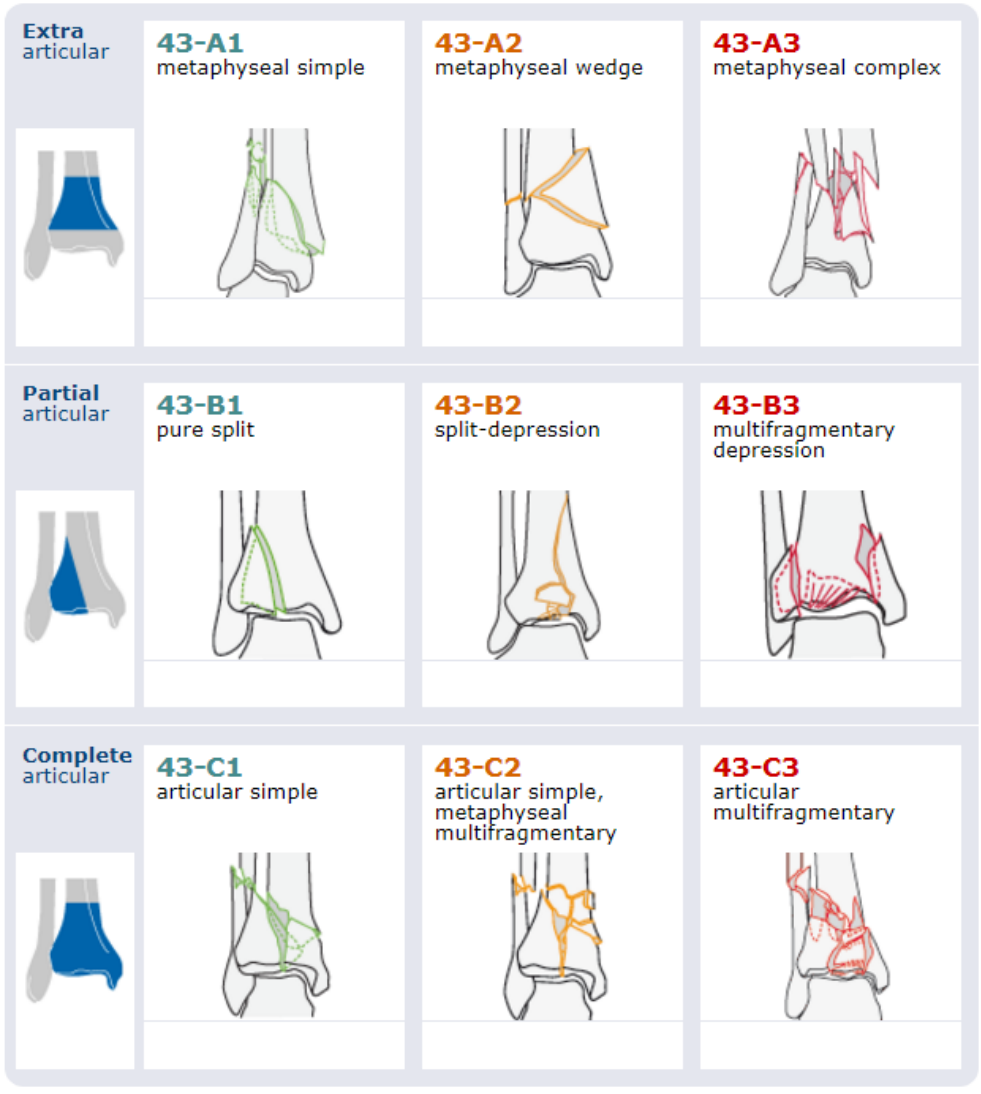
Distal tibia



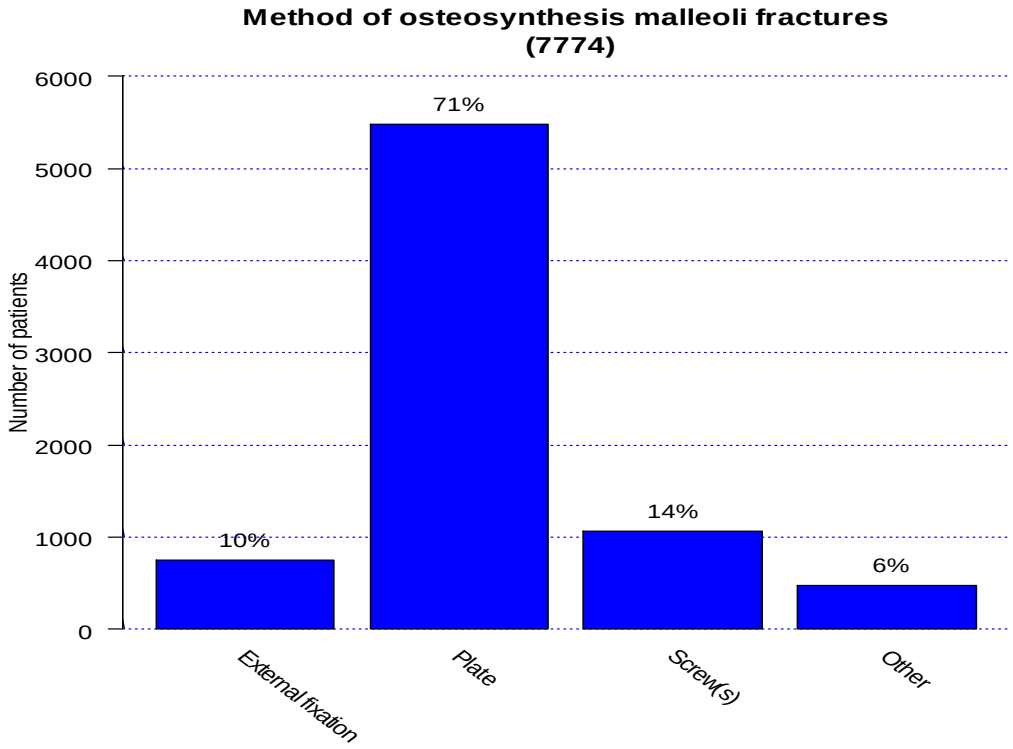


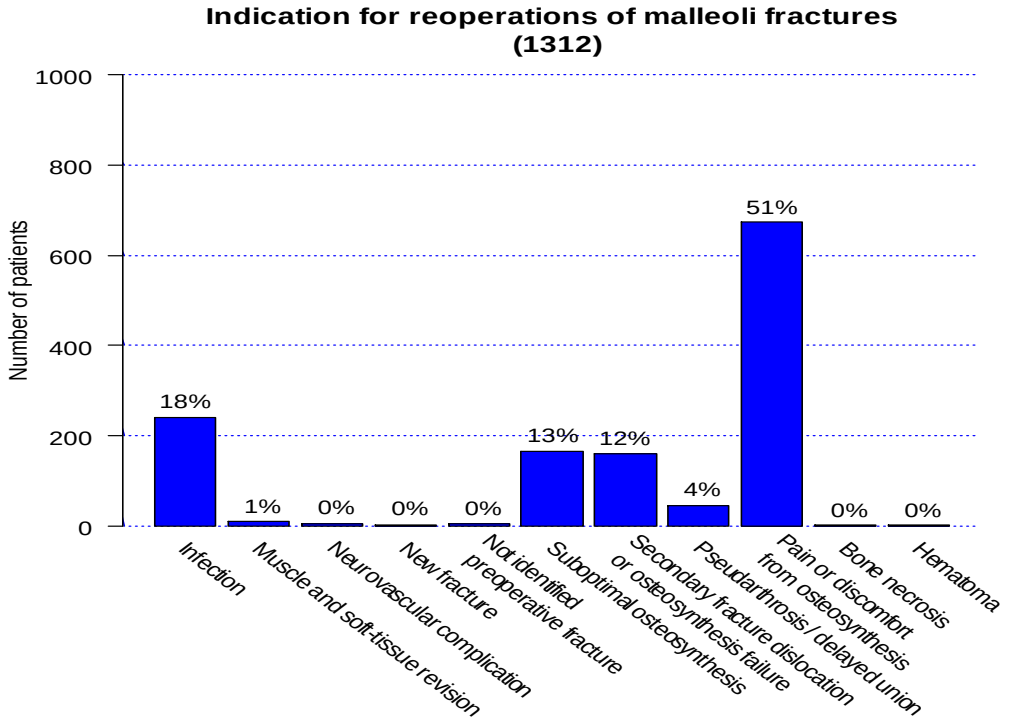

Surgeon level for distal tibia fractures
(600)
Number of patients
400
300
200
100
0
7%
6%
12%
13%
57%
5%
1 year resident
2 year resident
3 year resident
4-5 year resident
Attending
Traumatologist

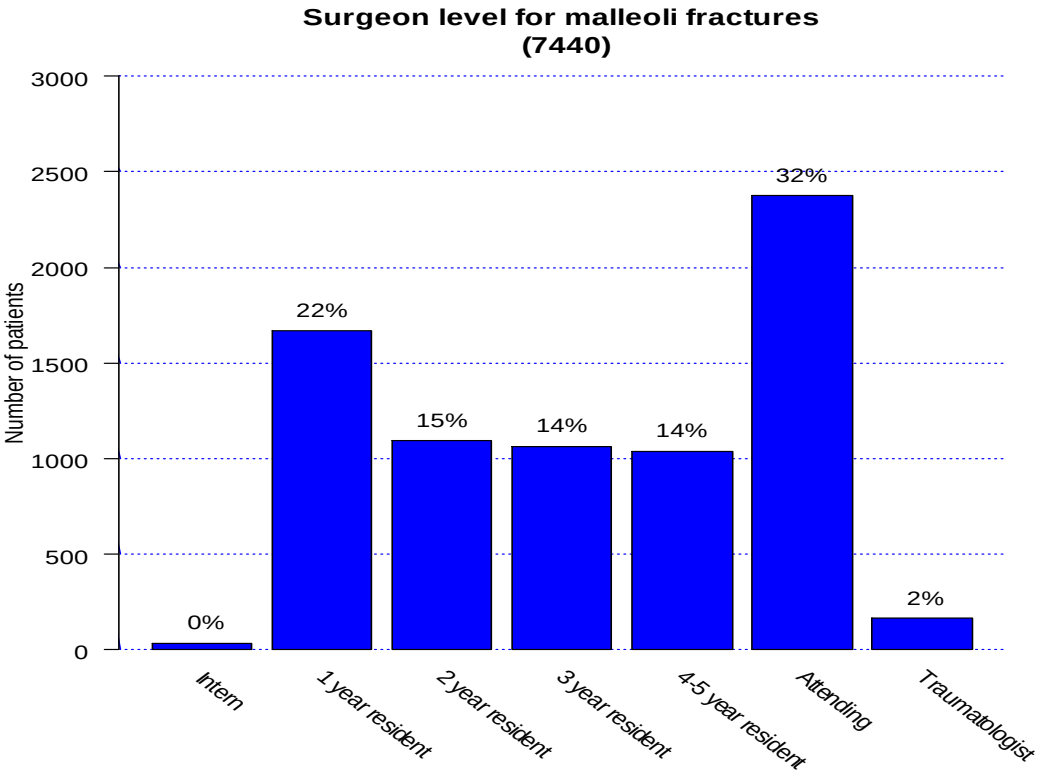


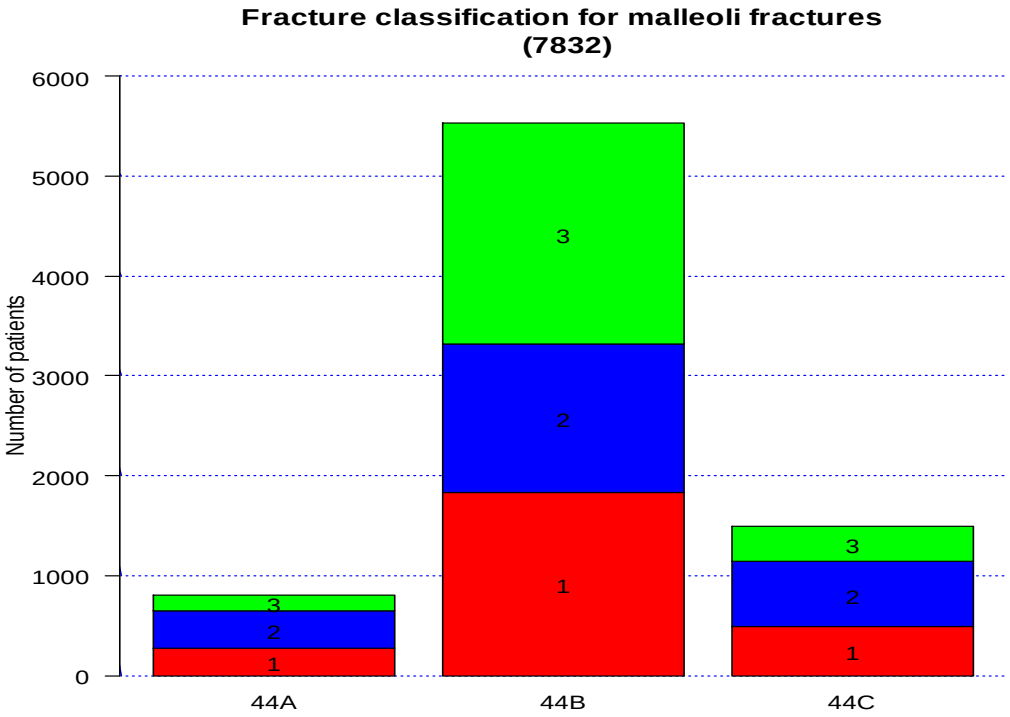


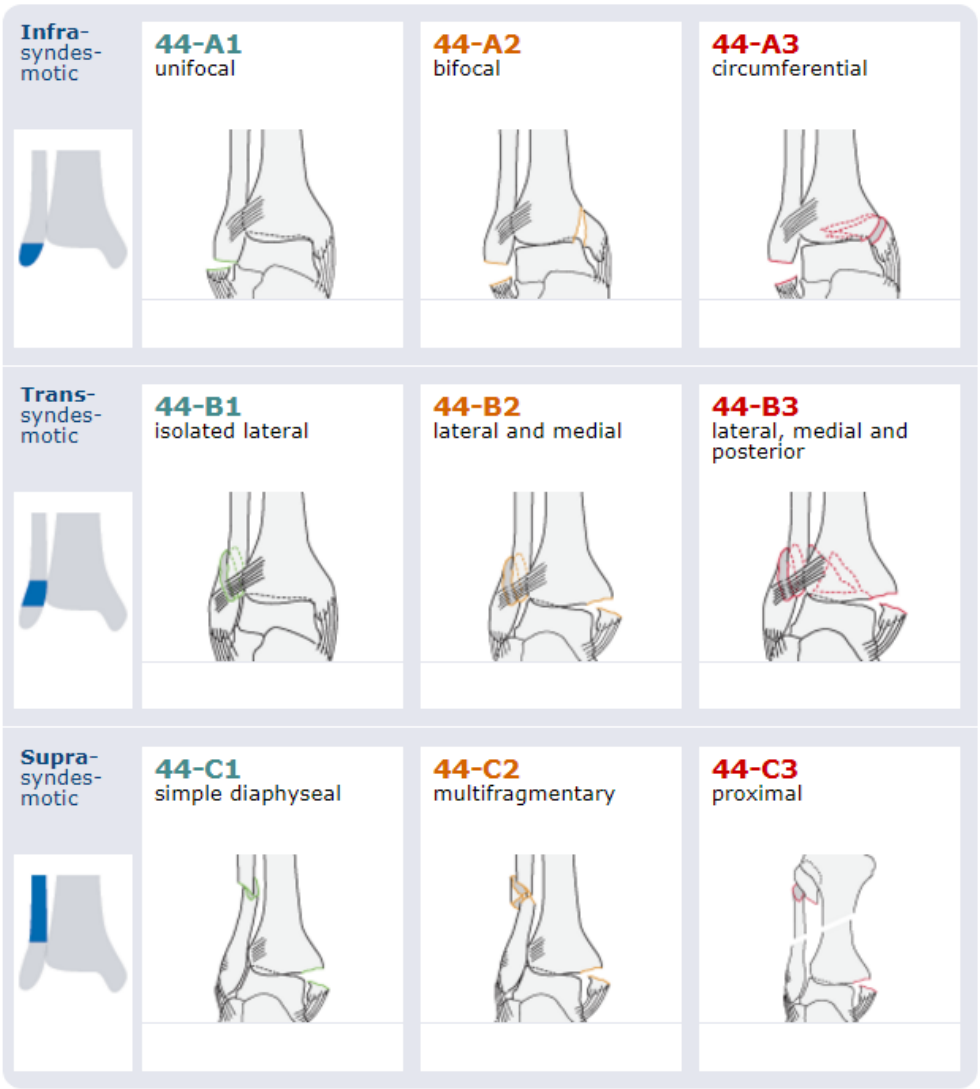
Malleoli


Method of osteosynthesis malleoli fractures
(7774)
Number of patients
6000
5000
4000
3000
2000
1000
0
71%
10%
14%
6%
External fixation
Plate
Screw(s)
Other

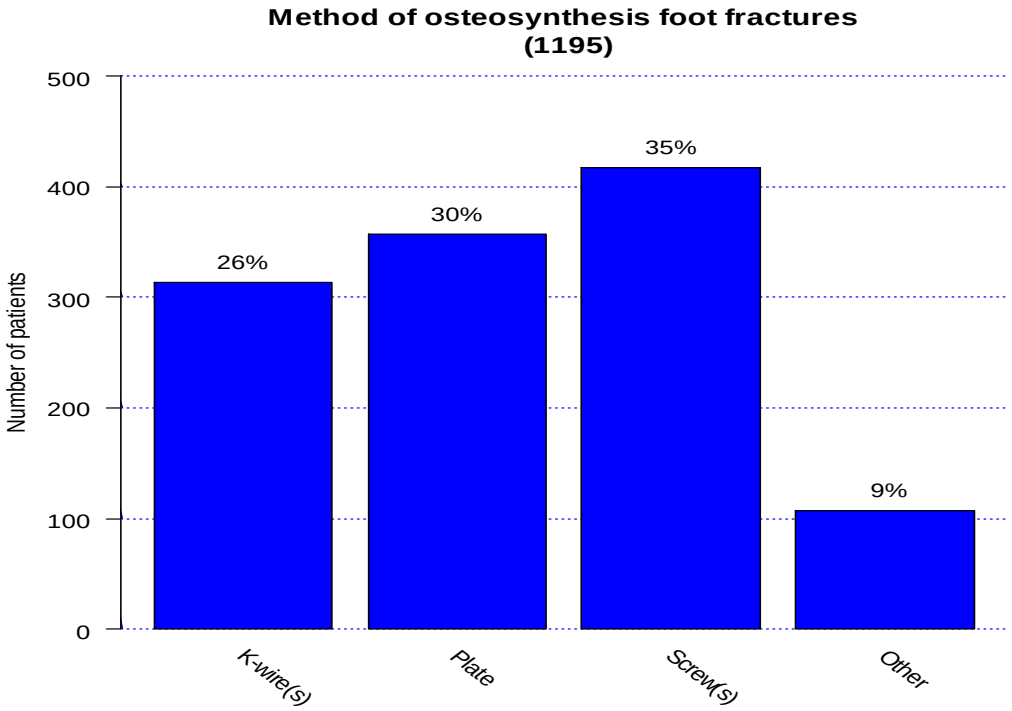

Indication for reoperations of malleoli fractures
(1312)
Number of patients
1000
800
600
400
200
0
18%
1%
0%
0%
0%
13%
12%
4%
51%
0%
0%
Infection
Muscle and soft-tissue revision
Neurovascular complication
New fracture
Not identified preoperative fracture
Suboptimal osteosynthesis
Secondary fracture dislocation or osteosynthesis failure
Pseudarthrosis / delayed union
Pain or discomfort from osteosynthesis
Bone necrosis
Hematoma

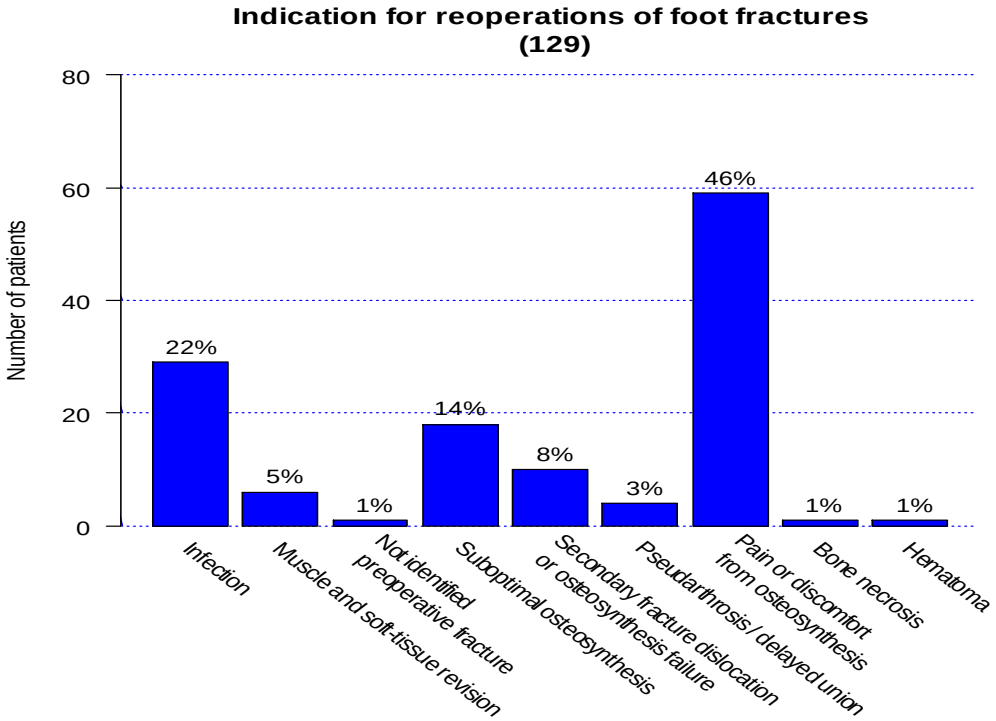

Surgeon level for malleoli fractures
(7440)
Number of patients
3000
2500
2000
1500
1000
500
0
0%
22%
15%
14%
14%
32%
2%
Intern
1 year resident
2 year resident
3 year resident
4-5 year resident
Attending
Traumatologist

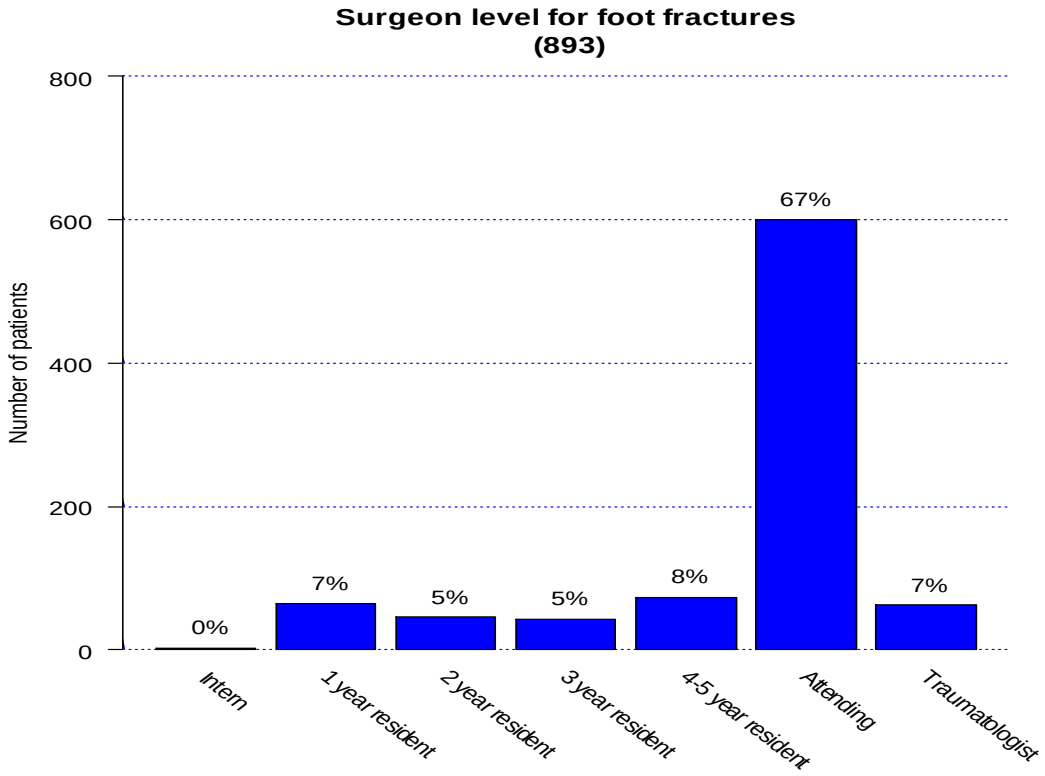


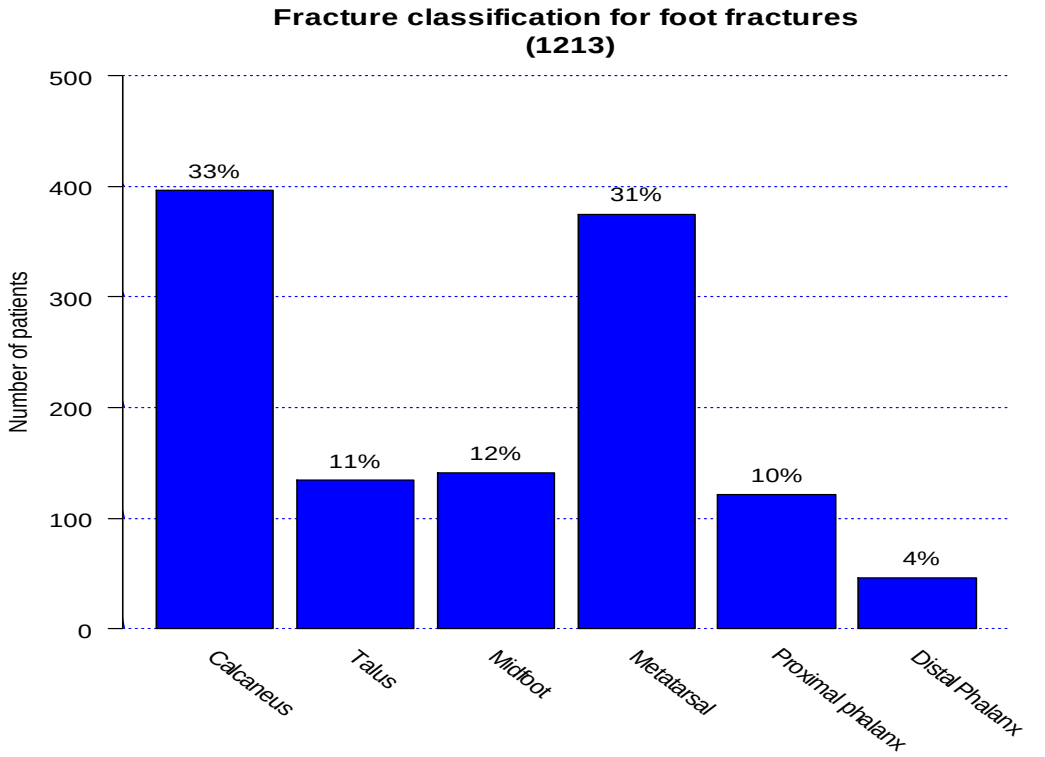


Foot

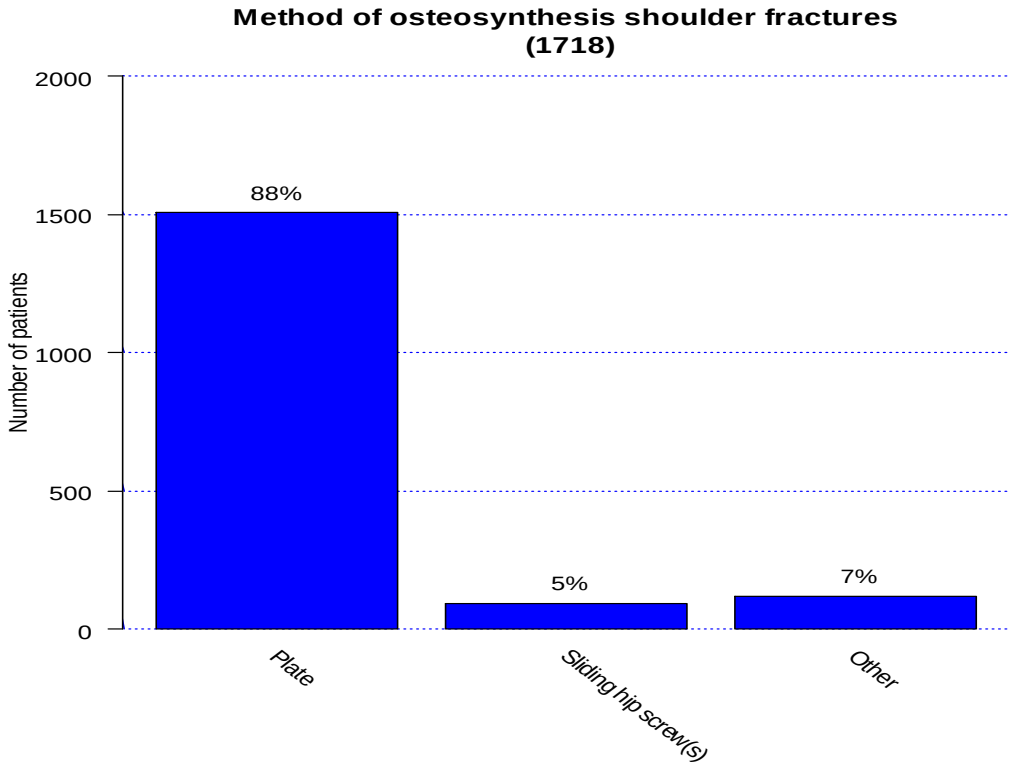

Method of osteosynthesis foot fractures
(1195)
Number of patients
500
400
300
200
100
0
26%
30%
35%
9%
K-wire(s)
Plate
Screw(s)
Other

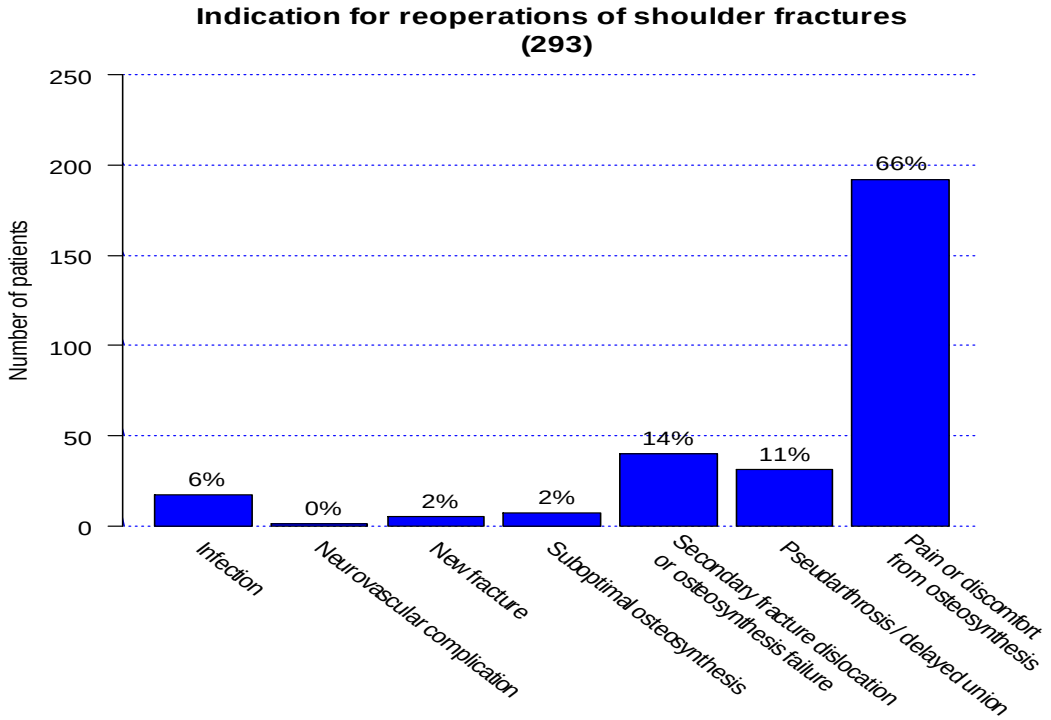

Indication for reoperations of foot fractures
(129)
Number of patients
80
60
40
20
0
22%
5%
1%
14%
8%
3%
46%
1%
1%
Infection
Muscle and soft-tissue revision
Not identified preoperative fracture
Suboptimal osteosynthesis
Secondary fracture dislocation or osteosynthesis failure
Pseudarthrosis / delayed union
Pain or discomfort from osteosynthesis
Bone necrosis
Hematoma

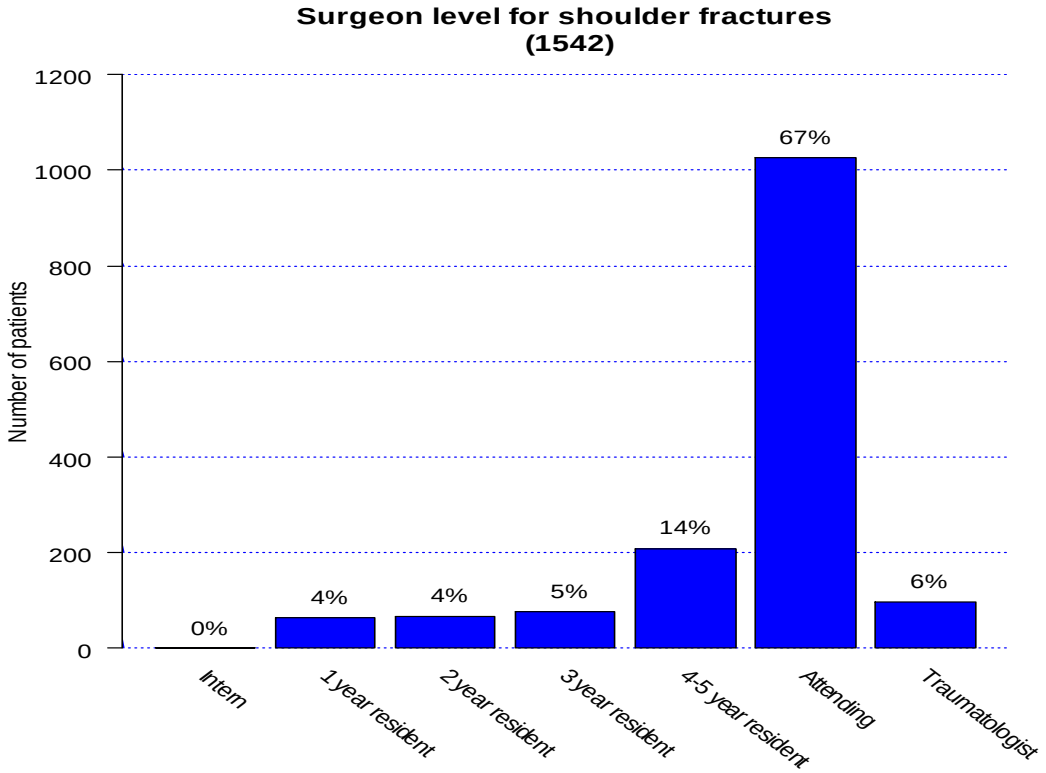

Surgeon level for foot fractures
(893)
Number of patients
800
600
400
200
0
0%
7%
5%
5%
8%
67%
7%
Intern
1 year resident
2 year resident
3 year resident
4-5 year resident
Attending
Traumatologist

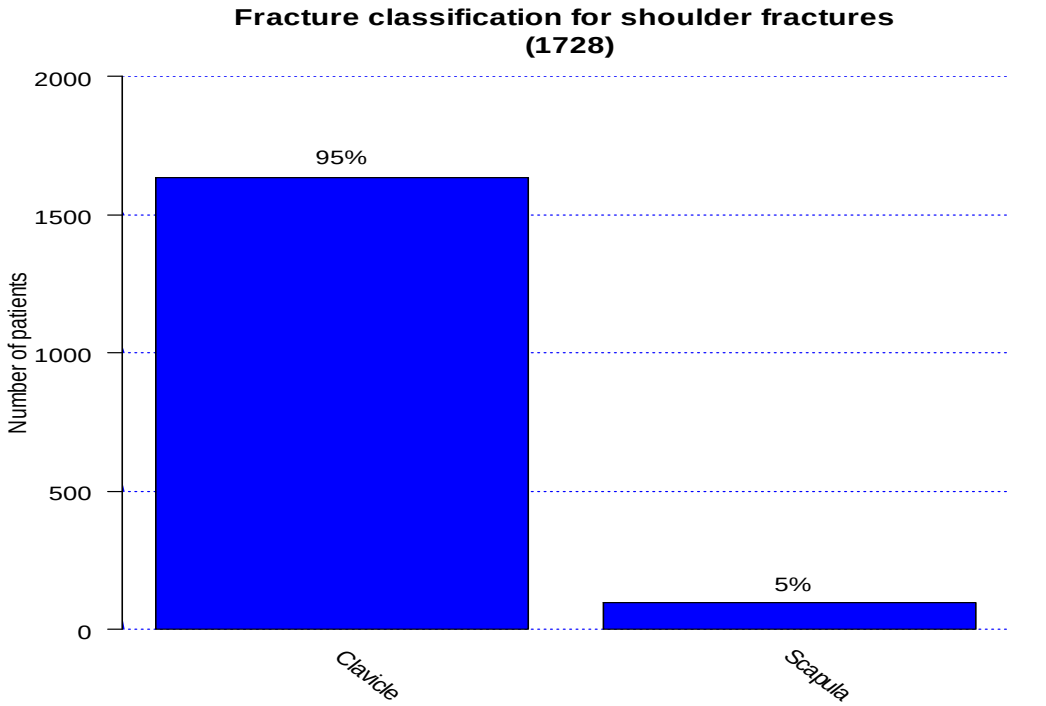

Fracture classification for foot fractures
(1213)
Number of patients
500
400
300
200
100
0
33%
11%
12%
31%
10%
4%
Calcaneus
Talus
Midfoot
Metatarsal
Proximal phalanx
Distal Phalanx

Shoulder


Method of osteosynthesis shoulder fractures
(1718)
Number of patients
2000
1500
1000
500
0
88%
5%
7%
Plate
Sliding hip screw(s)
Other

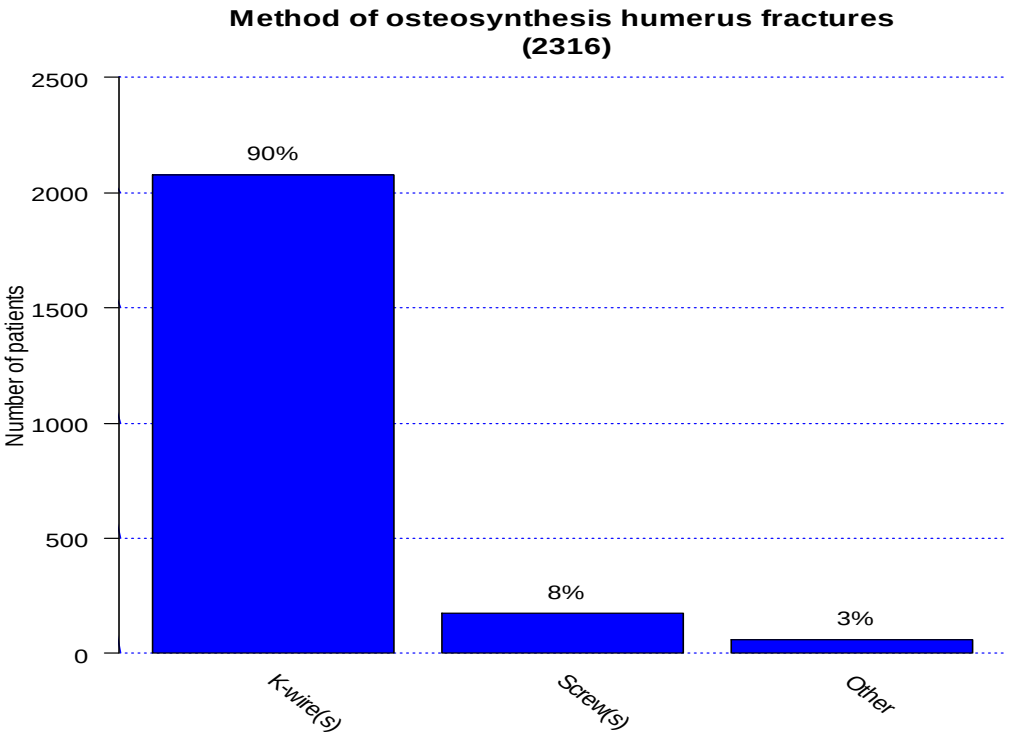

Indication for reoperations of shoulder fractures
(293)
Number of patients
250
200
150
100
50
0
6%
0%
2%
2%
14%
11%
66%
Infection
Neurovascular complication
New fracture
Suboptimal osteosynthesis
Secondary fracture dislocation or osteosynthesis failure
Pseudarthrosis / delayed union
Pain or discomfort from osteosynthesis

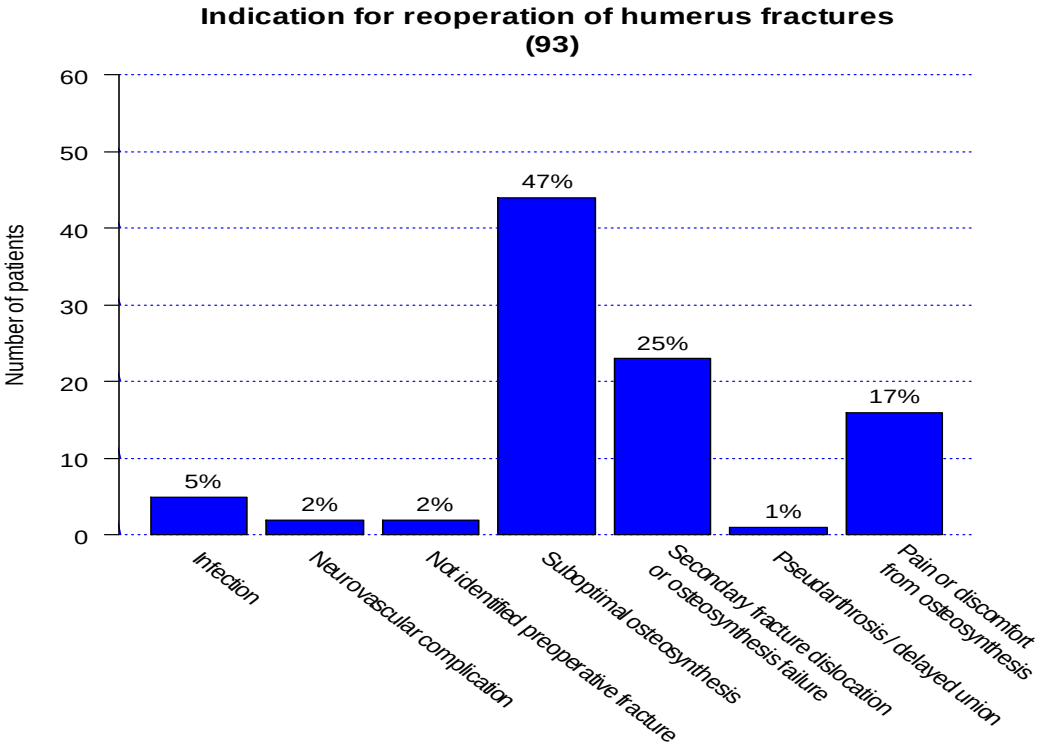

Surgeon level for shoulder fractures
(1542)
Number of patients
1200
1000
800
600
400
200
0
0%
4%
4%
5%
14%
67%
6%
Intern
1 year resident
2 year resident
3 year resident
4-5 year resident
Attending
Traumatologist

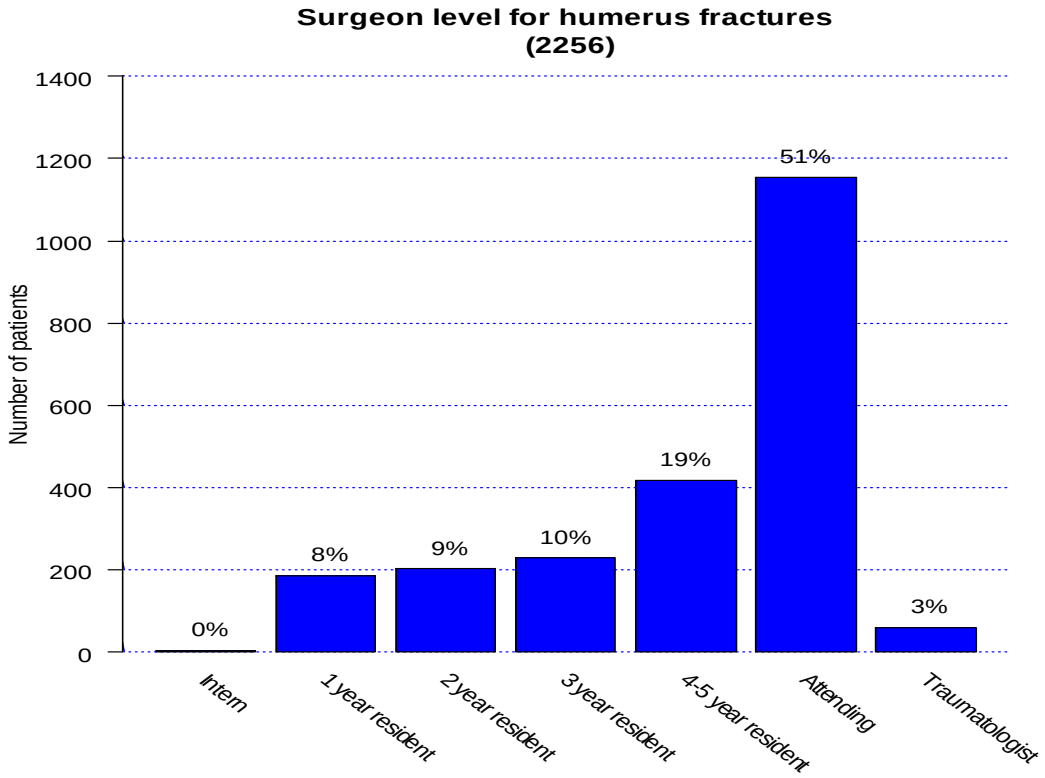

Fracture classification for shoulder fractures
(1728)
Number of patients
2000
1500
1000
500
0
95%
5%
Clavicle
Scapula

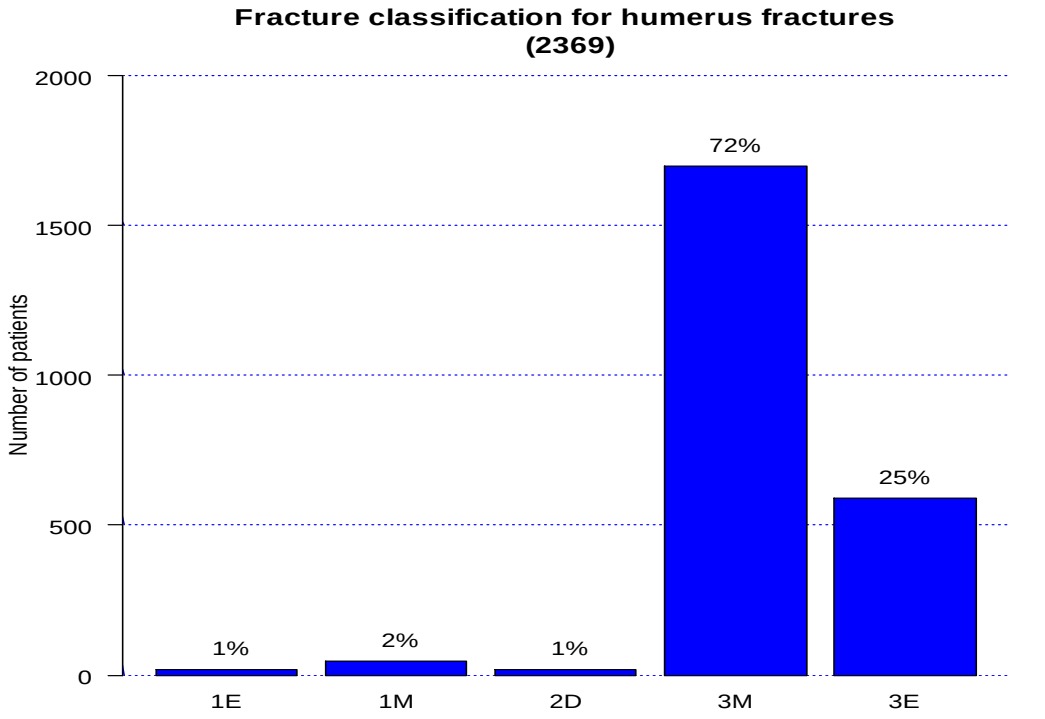
Pediatric

Humerus

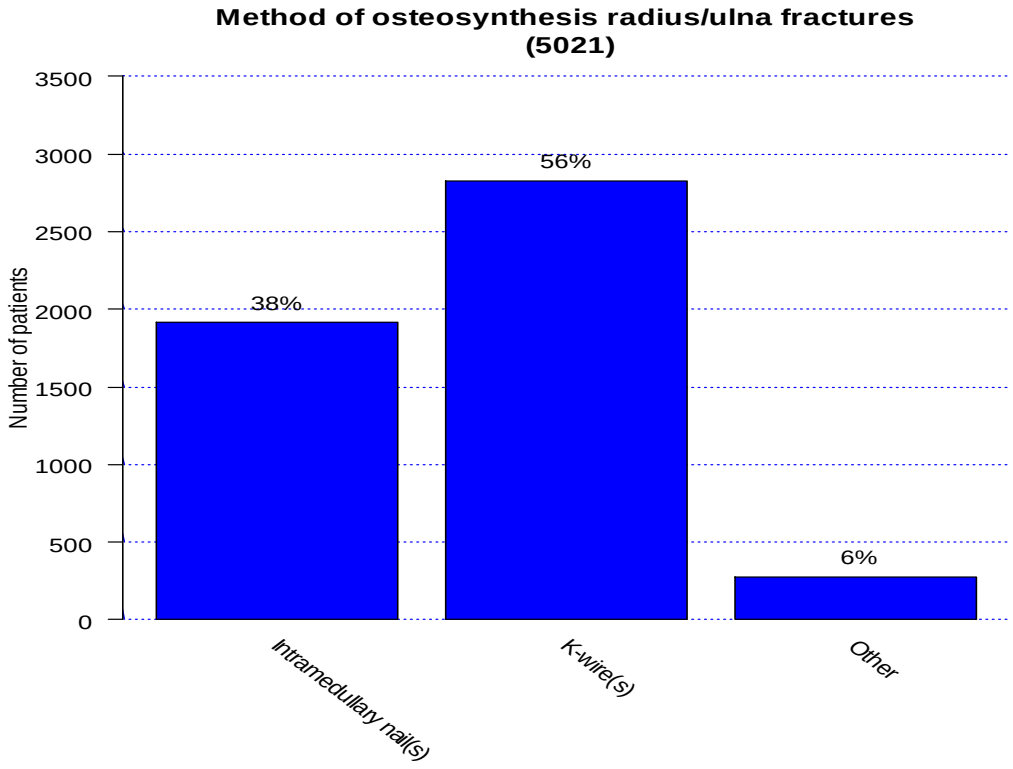


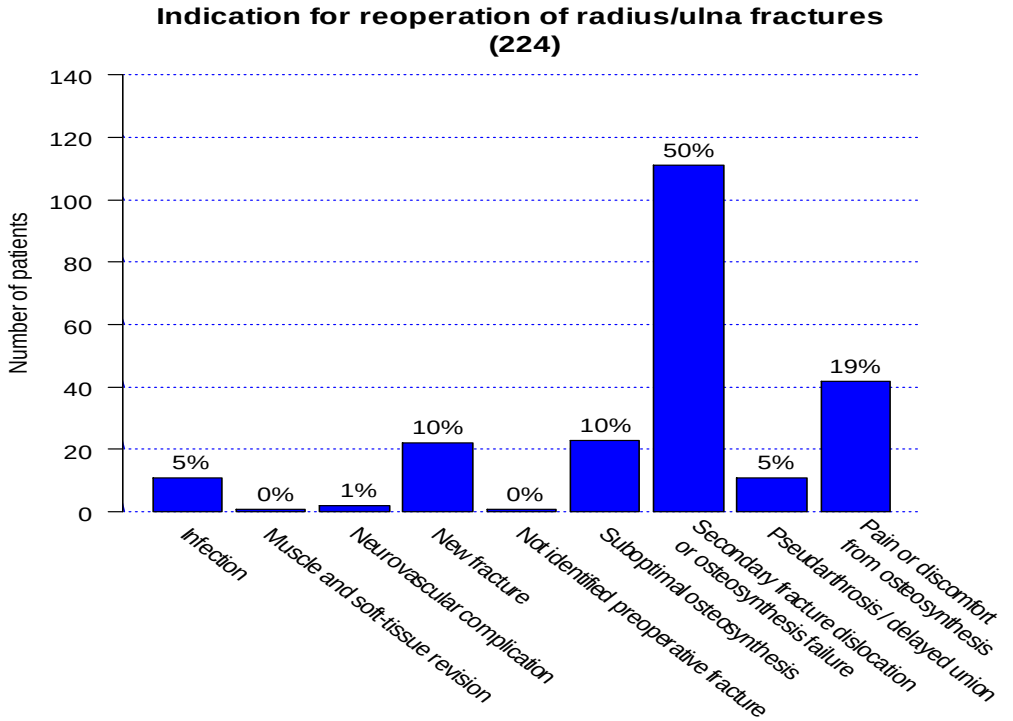


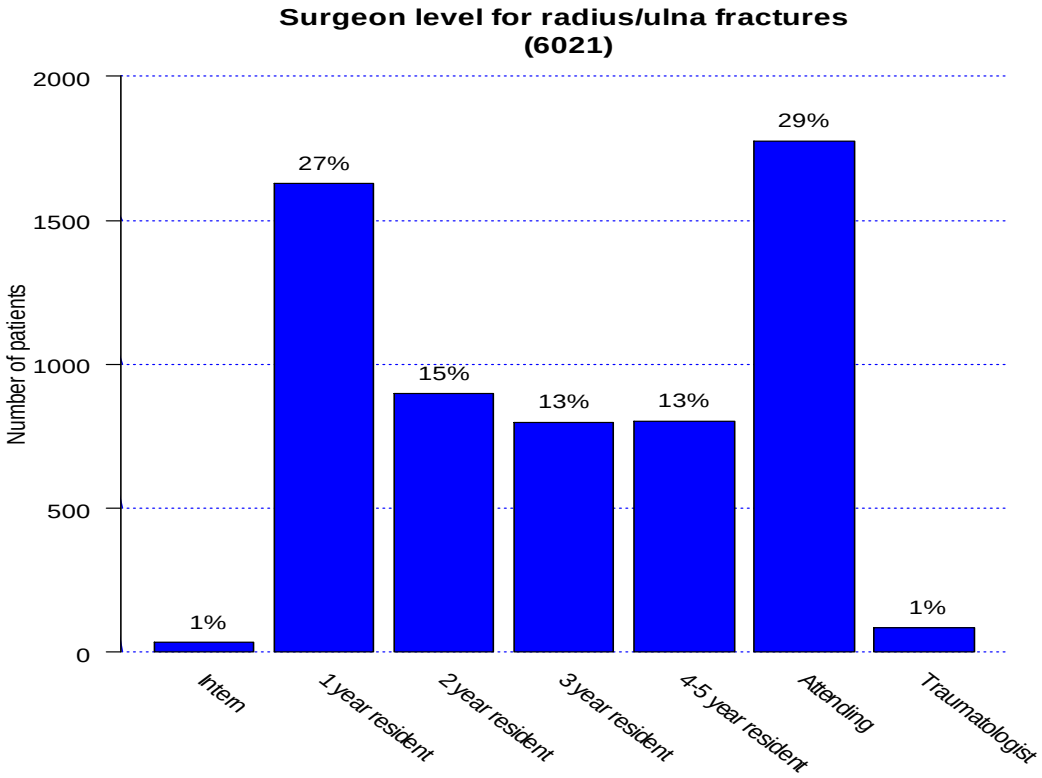

Surgeon level for humerus fractures
(2256)
Number of patients
1400
1200
1000
800
600
400
200
0
0%
8%
9%
10%
19%
51%
3%
Intern
1 year resident
2 year resident
3 year resident
4-5 year resident
Attending
Traumatologist

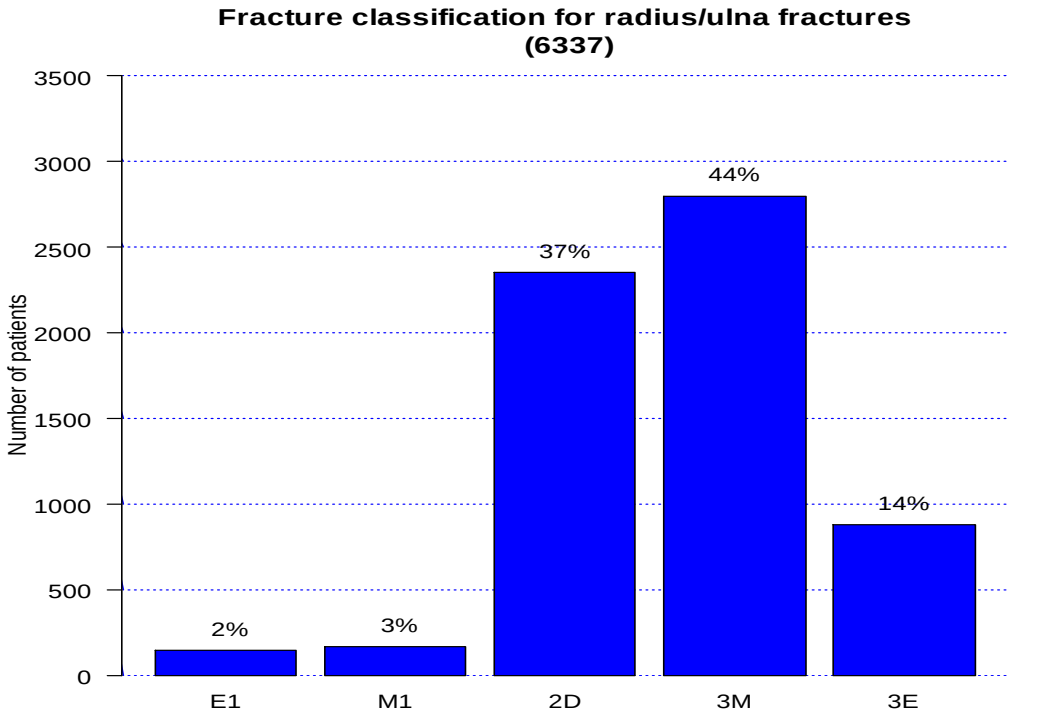

Fracture classification for humerus fractures
(2369)
Number of patients
2000
1500
1000
500
0
1%
2%
1%
72%
25%
1E
1M
2D
3M
3E

Radius/Ulna

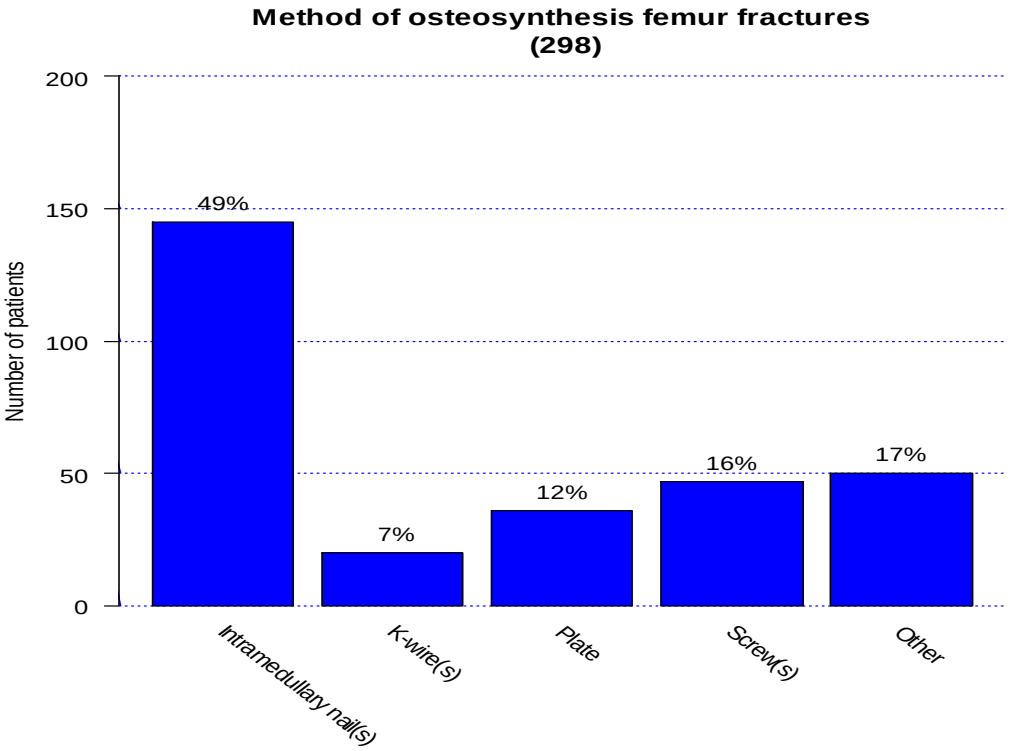

Method of osteosynthesis radius/ulna fractures (5021)
Number of patients
3500
3000
2500
2000
1500
1000
500
0
38%
56%
6%
Intramedullary nail(s)
K-wire(s)
Other

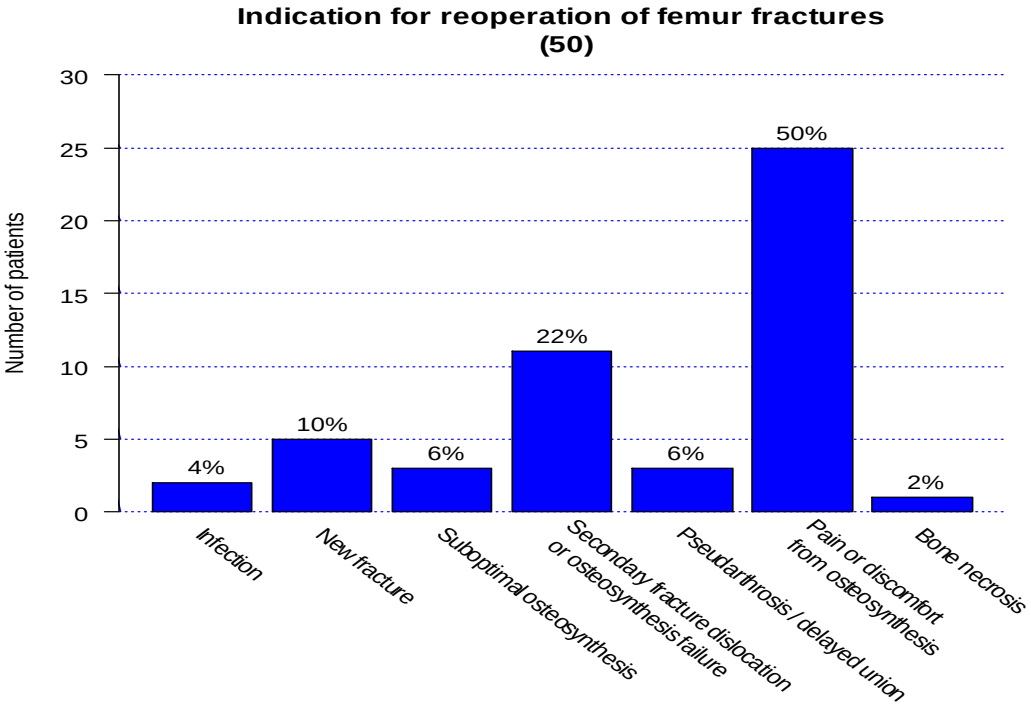

Indication for reoperation of radius/ulna fractures (224)
Number of patients
140
120
100
80
60
40
20
0
5%
0%
1%
10%
0%
10%
50%
5%
19%
Infection
Muscle and soft-tissue revision
Neurovascular complication
New fracture
Not identified preoperative fracture
Suboptimal osteosynthesis
Secondary fracture dislocation or osteosynthesis failure
Pseudarthrosis / delayed union
Pain or discomfort from osteosynthesis

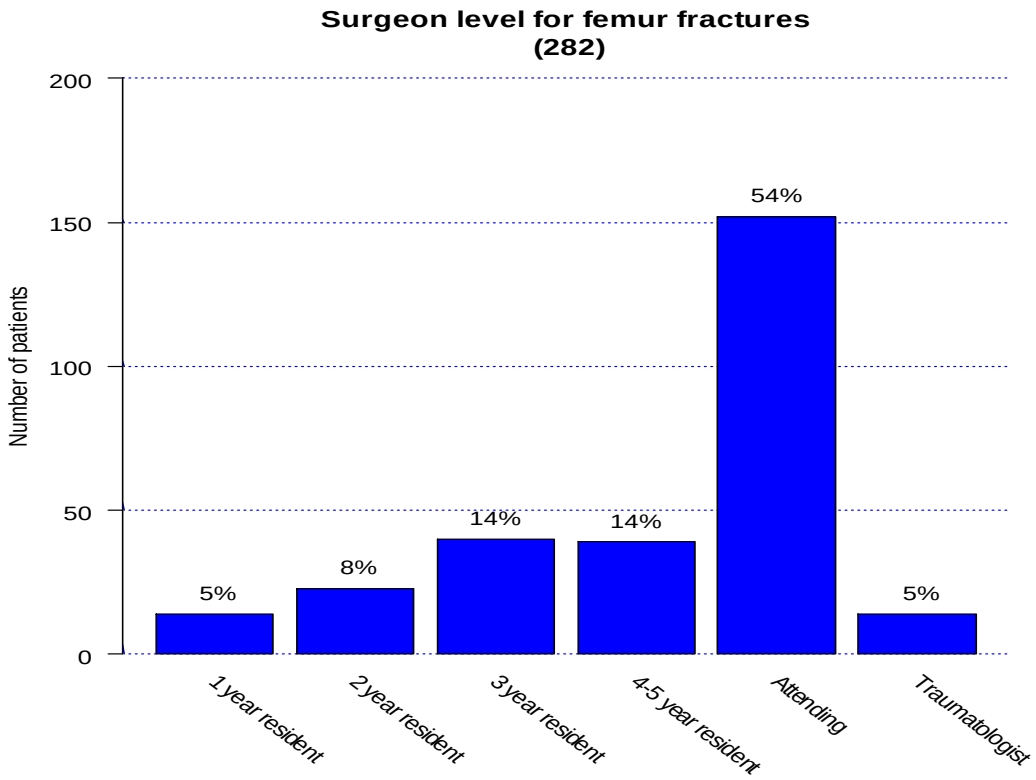

Surgeon level for radius/ulna fractures
(6021)
Number of patients
2000
1500
1000
500
0
1%
27%
15%
13%
13%
29%
1%
Intern
1 year resident
2 year resident
3 year resident
4-5 year resident
Attending
Traumatologist

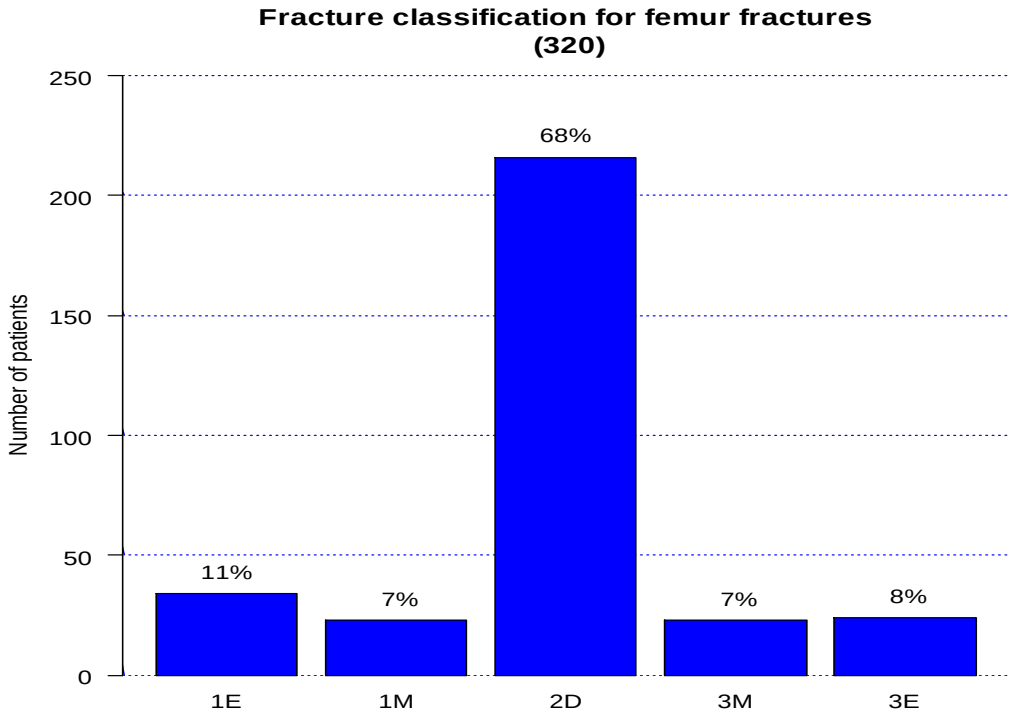

Fracture classification for radius/ulna fractures
(6337)
Number of patients
3500
3000
2500
2000
1500
1000
500
0
2%
3%
37%
44%
14%
E1
M1
2D
3M
3E

Femur

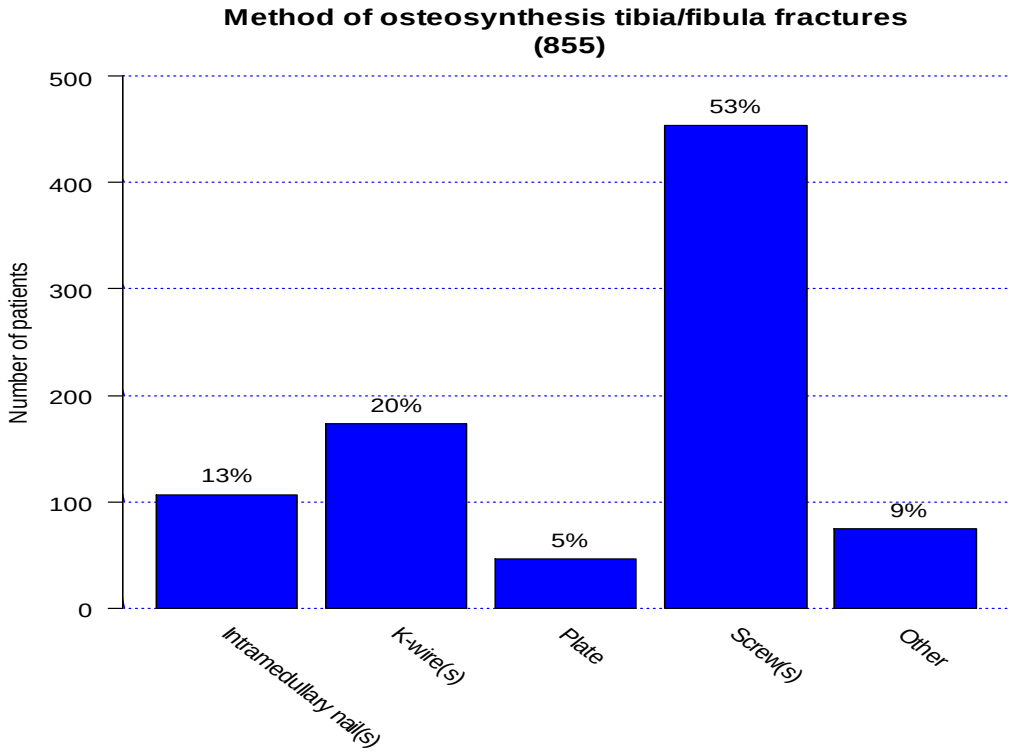

Method of osteosynthesis femur fractures
(298)
Number of patients
200
150
100
50
0
49%
7%
12%
16%
17%
Intramedullary nail(s)
K-wire(s)
Plate
Screw(s)
Other

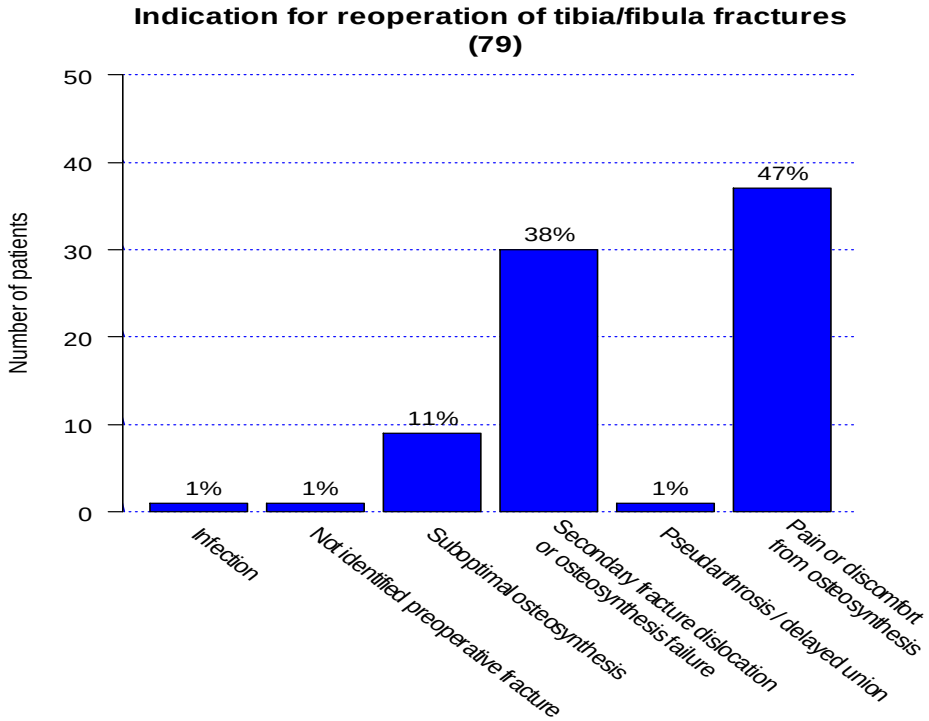

Indication for reoperation of femur fractures
(50)
Number of patients
30
25
20
15
10
5
0
4%
10%
6%
22%
6%
50%
2%
Infection
New fracture
Suboptimal osteosynthesis
Secondary fracture dislocation or osteosynthesis failure
Pseudarthrosis / delayed union
Pain or discomfort from osteosynthesis
Bone necrosis

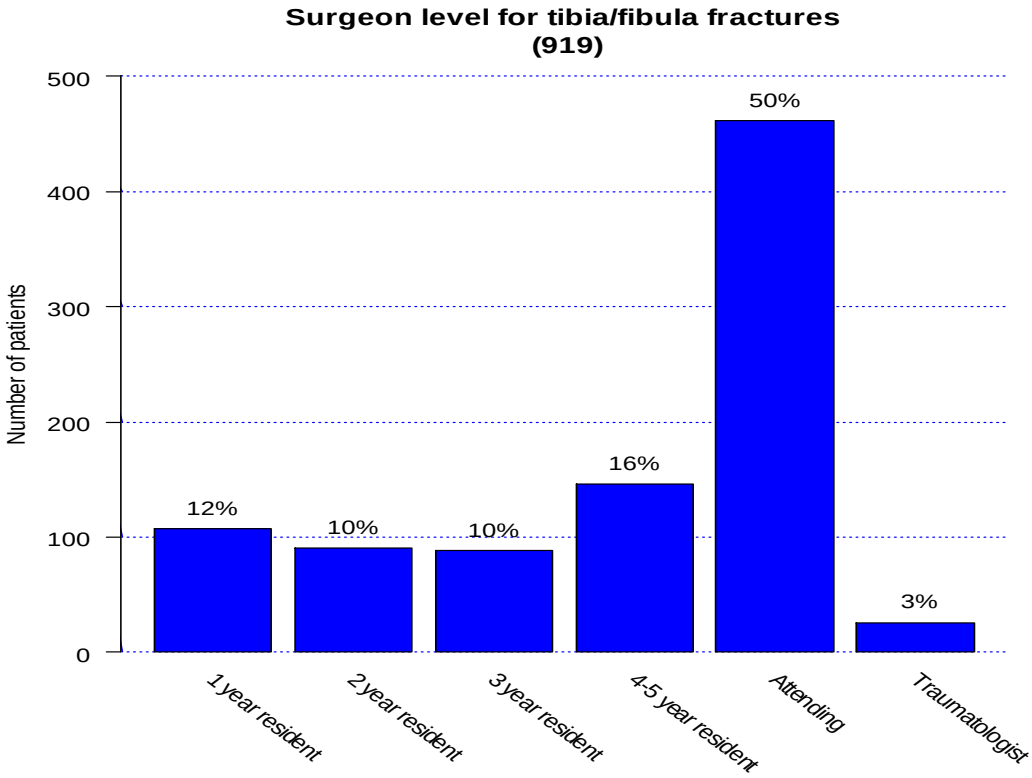

Surgeon level for femur fractures
(282)
Number of patients
200
150
100
50
0
5%
8%
14%
14%
54%
5%
1 year resident
2 year resident
3 year resident
4-5 year resident
Attending
Traumatologist

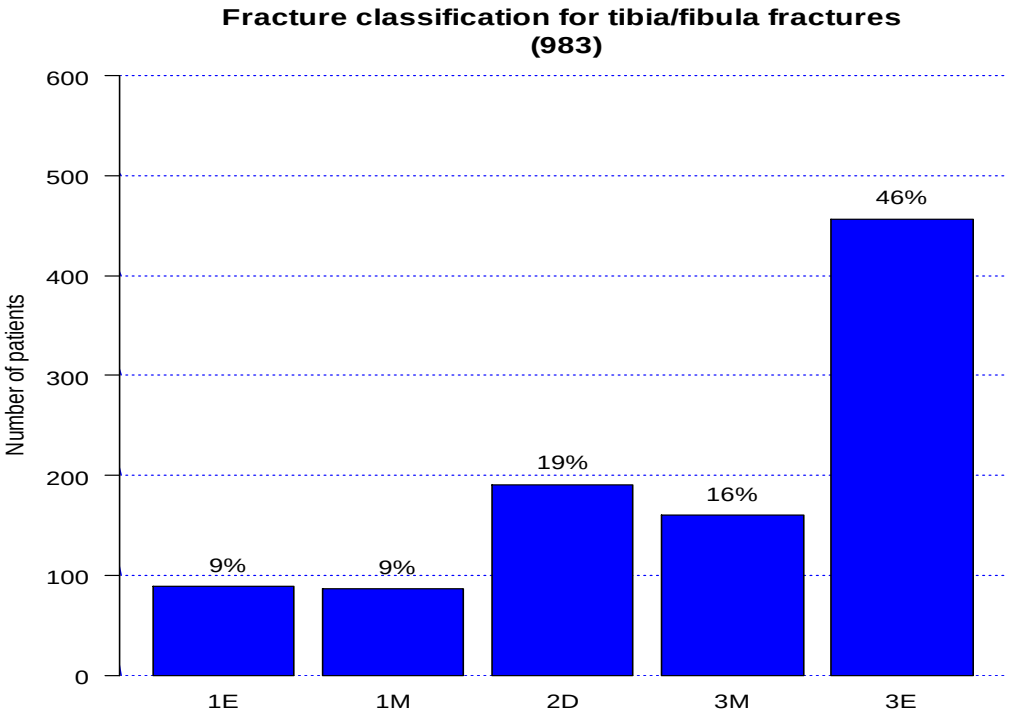

Fracture classification for femur fractures
(320)
Number of patients
250
200
150
100
50
0
11%
7%
68%
7%
8%
1E
1M
2D
3M
3E

Tibia/fibula

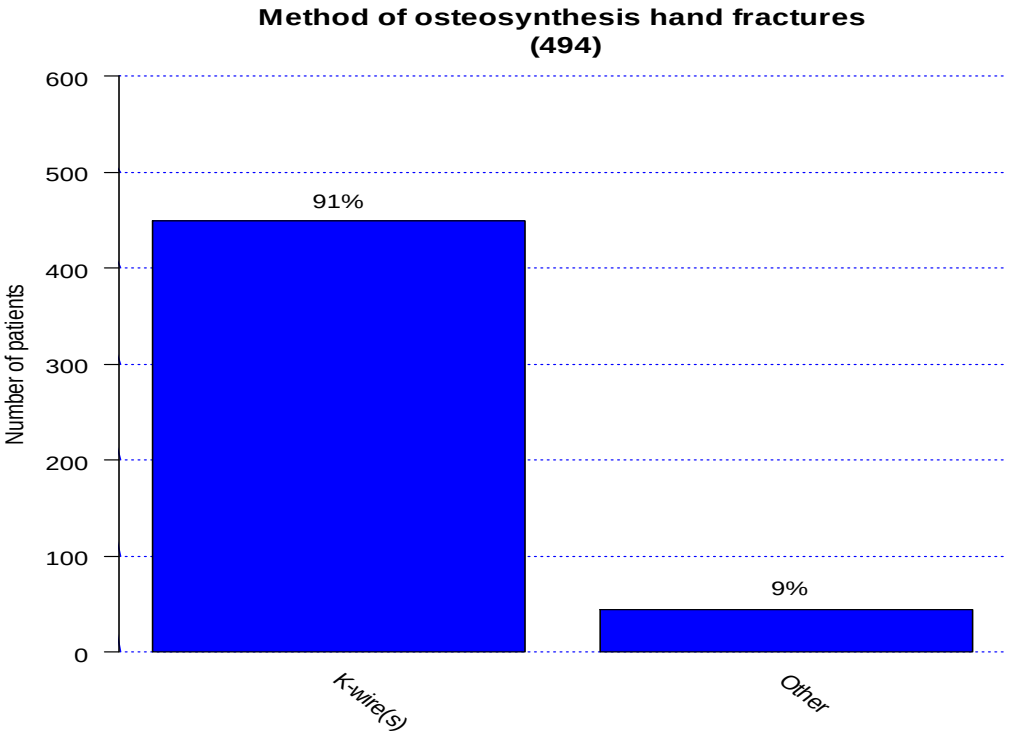


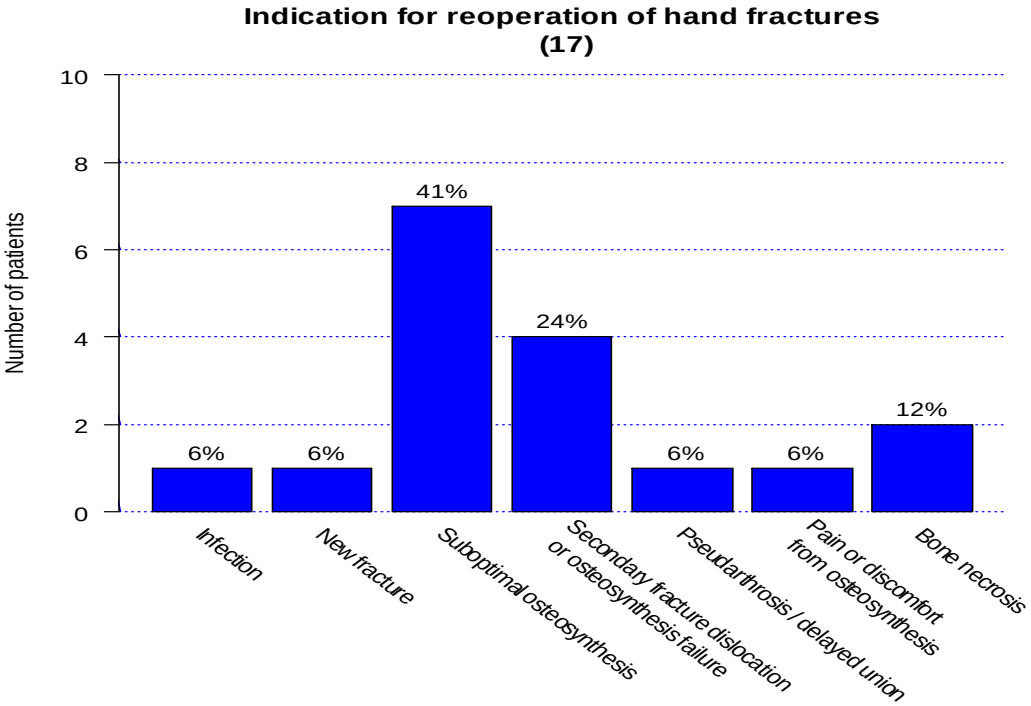


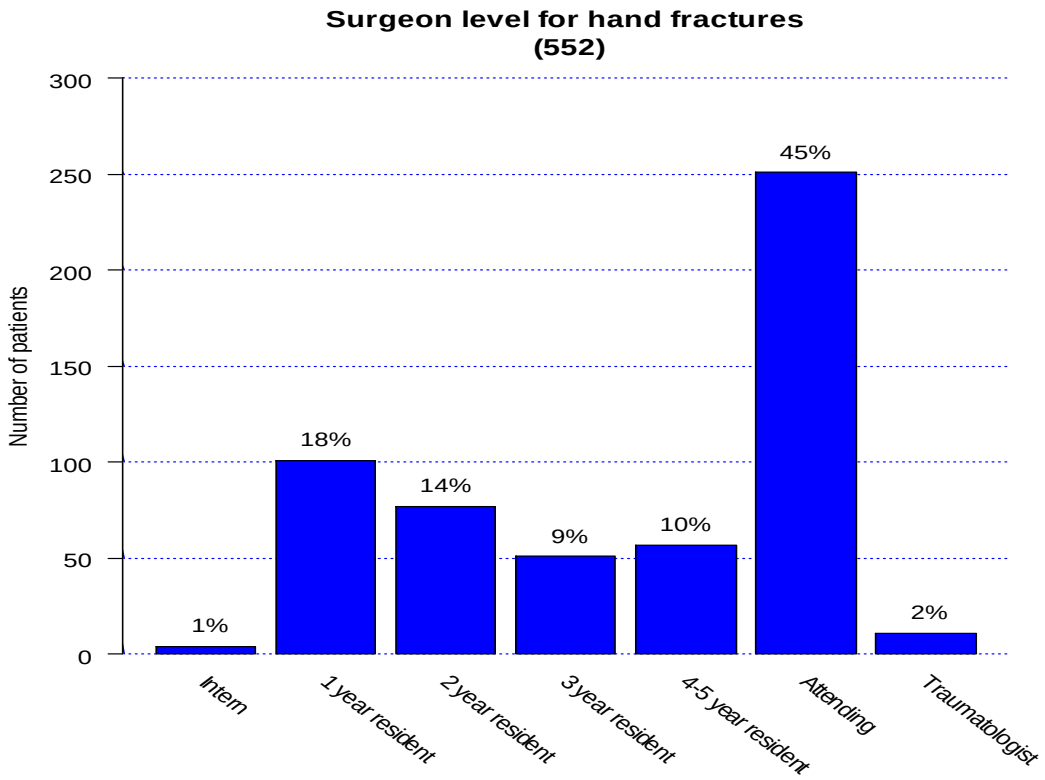

Surgeon level for tibia/fibula fractures
(919)
Number of patients
500
400
300
200
100
0
12%
10%
10%
16%
50%
3%
1 year resident
2 year resident
3 year resident
4-5 year resident
Attending
Traumatologist


Fracture classification for tibia/fibula fractures
(983)
Number of patients
600
500
400
300
200
100
0
9%
9%
19%
16%
46%
1E
1M
2D
3M
3E

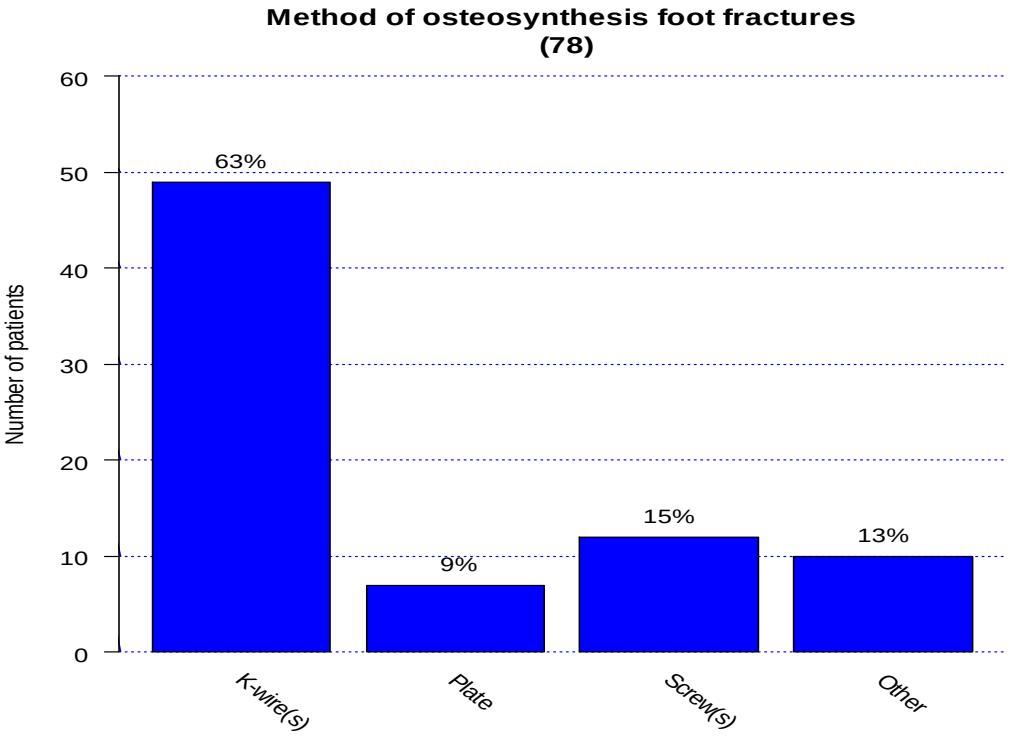
Hand

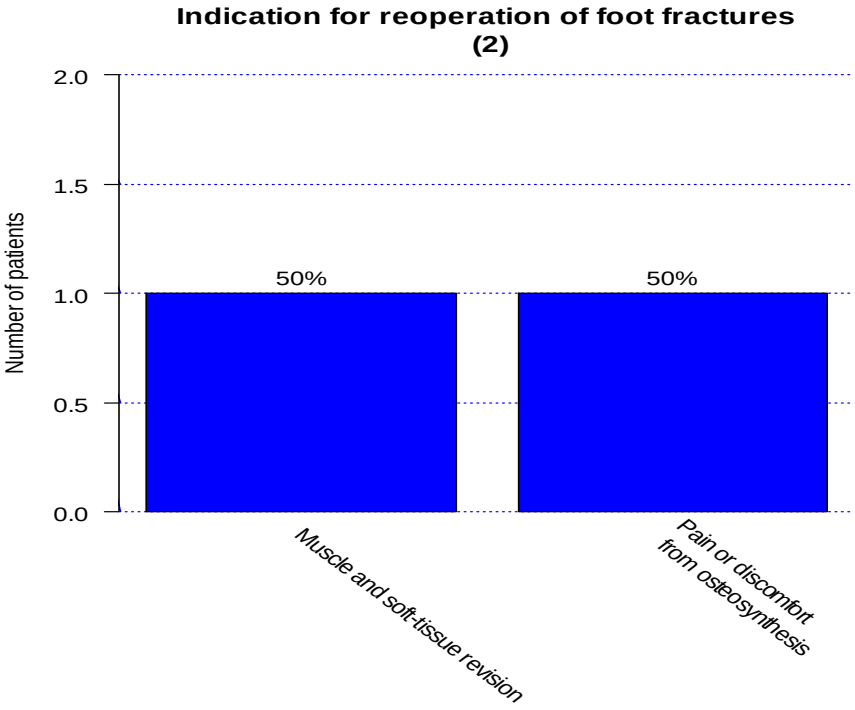

Method of osteosynthesis hand fractures
(494)
Number of patients
600
500
400
300
200
100
0
91%
9%
K-wire(s)
Other

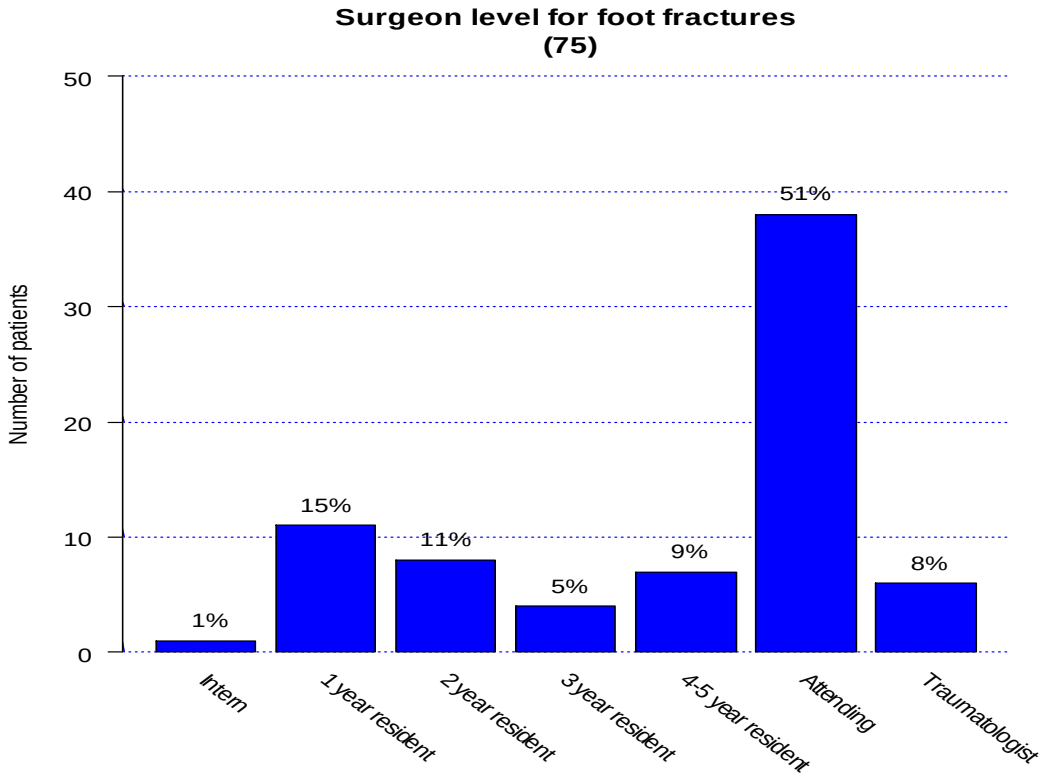

Indication for reoperation of hand fractures
(17)
Number of patients
10
8
6
4
2
0
6%
6%
41%
24%
6%
6%
12%
Infection
New fracture
Suboptimal osteosynthesis
Secondary fracture dislocation or osteosynthesis failure
Pseudarthrosis / delayed union
Pain or discomfort from osteosynthesis
Bone necrosis


Surgeon level for hand fractures
(552)
Number of patients
300
250
200
150
100
50
0
1%
18%
14%
9%
10%
45%
2%
Intern
1 year resident
2 year resident
3 year resident
4-5 year resident
Attending
Traumatologist

Foot


Method of osteosynthesis foot fractures
(78)
Number of patients
60
50
40
30
20
10
0
63%
9%
15%
13%
K-wire(s)
Plate
Screw(s)
Other


Indication for reoperation of foot fractures
(2)
Number of patients
2.0
1.5
1.0
0.5
0.0
50%
50%
Muscle and soft-tissue revision
Pain or discomfort from osteosynthesis


Surgeon level for foot fractures
(75)
Number of patients
50
40
30
20
10
0
1%
15%
11%
5%
9%
51%
8%
Intern
1 year resident
2 year resident
3 year resident
4-5 year resident
Attending
Traumatologist

Appendix 1

Registered parameter		Values
Patient related parameters	CPR	Unique ID
	Gender	Male / Female
	Age	Years
	ASA score*	1/2/3/4
Trauma related parameters	Operated side	Left / Right
	Date and Time of the radiological exam**	Time of the day and date
	Major Trauma ***	Yes / No
	Gustillo Type	Closed / 1 / 2 / 3a / 3b / 3c
	Neurovascular status	Unimpaired/ dysthesia /parasthesia / lack of pulse
	Pathologic fracture****	Yes / No
Surgery related parameters	Date and Time of surgery	Time of the day and date
	Procedure Type	Primary / secondary / planned*****
	Fracture Type	Adult / pediatric / periprostetic
	Fracture Diagnosis	AO Müller / Rorabeck / Vancouver classifica-
	Method of osteosynthesis	Locking plate, non-locking plate, screw (one or more), K-wire, steel wire, cable, threaded wire, intramedullary nail, elastic nail, external fixation (bars), external fixation (ring), hemi arthroplasty , total arthroplasty, sliding hip screw, intramedullary nail with sliding screw (short), intramedullary nail with sliding screw (long), Hook plate, removal of hardware, fracture reduction w/o osteosynthesis, Hook pins, Polyfix, arthroplasty reduction, locking attachment plate, syndesmotic screw(s), ASLS screw for intramedullary, none of the above.
	Supplemental surgical procedures	Arthrodesis, bone resection, osteotomy, bone suture, Bone transplant (autograft), Bone transplant (allograft), Bone transplant (substitute), Amputation, fasciotomy , soft-tissue debridement, brissement, hematoma evacuation, tendon surgery, nerve or vascular surgery, ligament surgery, none of the above, reaming, nerve decompression , secondary suture, meniscal / labral suture, meniscal / labral resection, prosthesis exchange, VAC therapy, skin transplant,
	Antibiotic prophylaxis	Yes / No
	Use of tourniquet	Yes / No
	Educational level of the surgeon	Intern, 1st year resident, 2nd year resident, 3rd year resident, 4-5th year resident, attending,
	Educational level of the supervisor if present	Intern, 1st year resident, 2nd year resident, 3rd year resident, 4-5th year resident, attending,

*: American Society of Anaesthesiologist (ASA) score

**: Date and time of the radiological examination that provided indication for surgery

***: Major trauma was defined as when a trauma team was assembled upon arrival of the patient to the hospital

****: Pathologic fracture as suspected on radiological exam

*****: A primary surgical procedure is defined as the first surgical procedure due to a fracture. A planned secondary procedure is defined as a surgical procedure that is a part of the primary treatment plan following primary surgery. A reoperation is defined as a surgical procedure that is not a part of an initial treatment plan following primary surgery

******: Traumatologist: attending in orthopaedic surgery with at least 2 years of trauma subspecialization.

Indications for reoperation:
Infection
Muscle- and soft-tissue revision
Neurovascular complication
New fracture
Not identified intraoperative fracture
Suboptimal osteosynthesis
Secondary fracture dislocation or osteosynthesis failure
Pseudoarthrosis
Bone necrosis
Pain or discomfort from osteosynthesis

Indications for reoperation that are registered by the surgeon in DFDB when reoperation is registered.