

## Supplementary data

### Appendix 1: Classification guide

## Classification Guide Ulnar Fractures

Add your name and number of review (1 or 2) in the file name when you save and send the excel document in. Also add name, number of review and start- and finish date for the review at the top of the document before you send it to the given e-mail address.

### AO/OTA classification

Main group: A, B or C translates to 1, 2 and 3. Register 1, 2 or 3 and if 1 see below.

Classify according to the descriptive text and register the corresponding bold number.

Ulna, distal end segment,  
**extraarticular fracture**  
2U3A

**1**



Ulna, distal end segment,  
**partial articular fracture**  
2U3B

**2**



Ulna, distal end segment,  
**complete articular fracture**  
2U3C

**3**

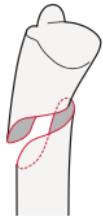


**If type A/1-fracture**, extra-articular fracture, classify according to sub-groups: classify according to the descriptive text and register the corresponding bold number (first number is main group A=1 and remaining numbers as of sub-group e.g. (2U3) A2.1=121)

**Group:** Ulna, distal end segment, extraarticular, **simple fracture** 2U3A2

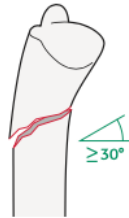
**Subgroups:**  
**Spiral fracture**  
2U3A2.1

**121**



**Oblique fracture ( $\geq 30^\circ$ )**  
2U3A2.2

**122**



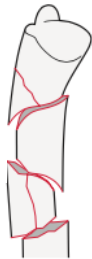
**Transverse fracture ( $< 30^\circ$ )**  
2U3A2.3

**123**



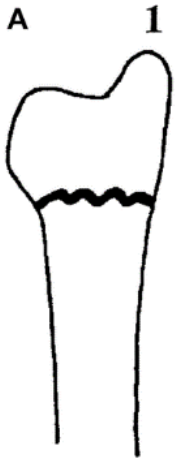
**Group:** Ulna, distal end segment, extraarticular, **multifragmentary fracture** 2U3A3

**13**



## **Biyani classification:**

Classify according to the description for type 1-4 and register the corresponding number.



**Type 1:** Extra-articular fractures with minimal styloid



**Type 2:** Fractures of the metaphysis and the ulnar comminution



Type 3: Ulna fracture combined with fracture  
ulna metaphysis

Type 4: Completely comminuted fracture of the of the ulnar styloid

**If the fracture does not match** any of the fracture types, or groups in the classification systems:

Register a 9 in AO/OTA or Biyani and a 1 to the right in the intended column for each classification system that cannot be classified, se excel file. Comment if the fracture is too proximal(not within the distal third of the ulna) or if it is an isolated styloid fracture since these need to be excluded.

## Appendix 2: Inter-rater results of each observer-pairs for AO/OTA

| Inter-rater<br>AO/OTA | Observers     | Kappa | 95% CI         | Agreement |
|-----------------------|---------------|-------|----------------|-----------|
| 1st review            | 1 vs 2        | 0.558 | 0.429 to 0.687 | Moderate  |
|                       | 1 vs 3        | 0.537 | 0.398 to 0.676 | Moderate  |
|                       | 1 vs 4        | 0.431 | 0.300 to 0.562 | Moderate  |
|                       | 1 vs 5        | 0.537 | 0.404 to 0.670 | Moderate  |
|                       | 1 vs 6        | 0.438 | 0.311 to 0.565 | Moderate  |
|                       | 2 vs 3        | 0.487 | 0.354 to 0.620 | Moderate  |
|                       | 2 vs 4        | 0.383 | 0.250 to 0.516 | Fair      |
|                       | 2 vs 5        | 0.451 | 0.322 to 0.580 | Moderate  |
|                       | 2 vs 6        | 0.284 | 0.168 to 0.400 | Fair      |
|                       | 3 vs 4        | 0.417 | 0.286 to 0.548 | Moderate  |
|                       | 3 vs 5        | 0.459 | 0.314 to 0.604 | Moderate  |
|                       | 3 vs 6        | 0.432 | 0.301 to 0.563 | Moderate  |
|                       | 4 vs 5        | 0.490 | 0.359 to 0.621 | Moderate  |
|                       | 4 vs 6        | 0.341 | 0.214 to 0.468 | Fair      |
|                       | 5 vs 6        | 0.470 | 0.349 to 0.592 | Moderate  |
|                       | Light's Kappa | 0.448 | 0.409 to 0.487 | Moderate  |
| 2nd review            | 1 vs 2        | 0.392 | 0.253 to 0.531 | Fair      |
|                       | 1 vs 3        | 0.549 | 0.420 to 0.678 | Moderate  |
|                       | 1 vs 4        | 0.263 | 0.157 to 0.369 | Fair      |
|                       | 1 vs 5        | 0.494 | 0.359 to 0.629 | Moderate  |
|                       | 1 vs 6        | 0.408 | 0.277 to 0.539 | Fair      |
|                       | 2 vs 3        | 0.452 | 0.315 to 0.589 | Moderate  |
|                       | 2 vs 4        | 0.248 | 0.140 to 0.356 | Fair      |
|                       | 2 vs 5        | 0.468 | 0.331 to 0.605 | Moderate  |

|            |               |       |                |             |
|------------|---------------|-------|----------------|-------------|
|            | 2 vs 6        | 0.332 | 0.205 to 0.459 | Fair        |
|            | 3 vs 4        | 0.308 | 0.192 to 0.424 | Fair        |
|            | 3 vs 5        | 0.659 | 0.524 to 0.794 | Substantial |
|            | 3 vs 6        | 0.354 | 0.225 to 0.483 | Fair        |
|            | 4 vs 5        | 0.317 | 0.203 to 0.431 | Fair        |
|            | 4 vs 6        | 0.098 | 0.014 to 0.182 | Slight      |
|            | 5 vs 6        | 0.374 | 0.241 to 0.507 | Fair        |
|            | Light's Kappa | 0.381 | 0.241 to 0.395 | Fair        |
| Total mean |               | 0.414 | 0.375 to 0.453 | Moderate    |

### Appendix 3: Inter-rater results of each observer-pairs for Biyani

| Inter-rater<br>Biyani | Observers     | Kappa | 95% CI         | Agreement   |
|-----------------------|---------------|-------|----------------|-------------|
| 1st review            | 1 vs 2        | 0.495 | 0.364 to 0.626 | Moderate    |
|                       | 1 vs 3        | 0.444 | 0.303 to 0.585 | Moderate    |
|                       | 1 vs 4        | 0.410 | 0.271 to 0.549 | Moderate    |
|                       | 1 vs 5        | 0.452 | 0.313 to 0.591 | Moderate    |
|                       | 1 vs 6        | 0.319 | 0.190 to 0.448 | Fair        |
|                       | 2 vs 3        | 0.530 | 0.391 to 0.669 | Moderate    |
|                       | 2 vs 4        | 0.560 | 0.425 to 0.695 | Moderate    |
|                       | 2 vs 5        | 0.571 | 0.436 to 0.706 | Moderate    |
|                       | 2 vs 6        | 0.365 | 0.240 to 0.490 | Fair        |
|                       | 3 vs 4        | 0.433 | 0.290 to 0.576 | Moderate    |
|                       | 3 vs 5        | 0.372 | 0.225 to 0.519 | Fair        |
|                       | 3 vs 6        | 0.357 | 0.235 to 0.479 | Fair        |
|                       | 4 vs 5        | 0.581 | 0.444 to 0.718 | Moderate    |
|                       | 4 vs 6        | 0.307 | 0.191 to 0.423 | Fair        |
|                       | 5 vs 6        | 0.415 | 0.290 to 0.540 | Moderate    |
|                       | Light's Kappa | 0.441 | 0.391 to 0.491 | Moderate    |
| 2nd review            | 1 vs 2        | 0.517 | 0.382 to 0.652 | Moderate    |
|                       | 1 vs 3        | 0.560 | 0.423 to 0.697 | Moderate    |
|                       | 1 vs 4        | 0.472 | 0.333 to 0.611 | Moderate    |
|                       | 1 vs 5        | 0.555 | 0.422 to 0.688 | Moderate    |
|                       | 1 vs 6        | 0.263 | 0.136 to 0.390 | Fair        |
|                       | 2 vs 3        | 0.550 | 0.413 to 0.687 | Moderate    |
|                       | 2 vs 4        | 0.428 | 0.287 to 0.569 | Moderate    |
|                       | 2 vs 5        | 0.627 | 0.498 to 0.756 | Substantial |

|            |               |       |                |          |
|------------|---------------|-------|----------------|----------|
|            | 2 vs 6        | 0.411 | 0.278 to 0.544 | Moderate |
|            | 3 vs 4        | 0.430 | 0.283 to 0.577 | Moderate |
|            | 3 vs 5        | 0.589 | 0.456 to 0.722 | Moderate |
|            | 3 vs 6        | 0.379 | 0.252 to 0.506 | Fair     |
|            | 4 vs 5        | 0.472 | 0.335 to 0.609 | Moderate |
|            | 4 vs 6        | 0.251 | 0.137 to 0.365 | Fair     |
|            | 5 vs 6        | 0.474 | 0.341 to 0.607 | Moderate |
|            | Light's Kappa | 0.465 | 0.404 to 0.526 | Moderate |
| Total mean |               | 0.453 | 0.417 to 0.489 | Moderate |