



MAP

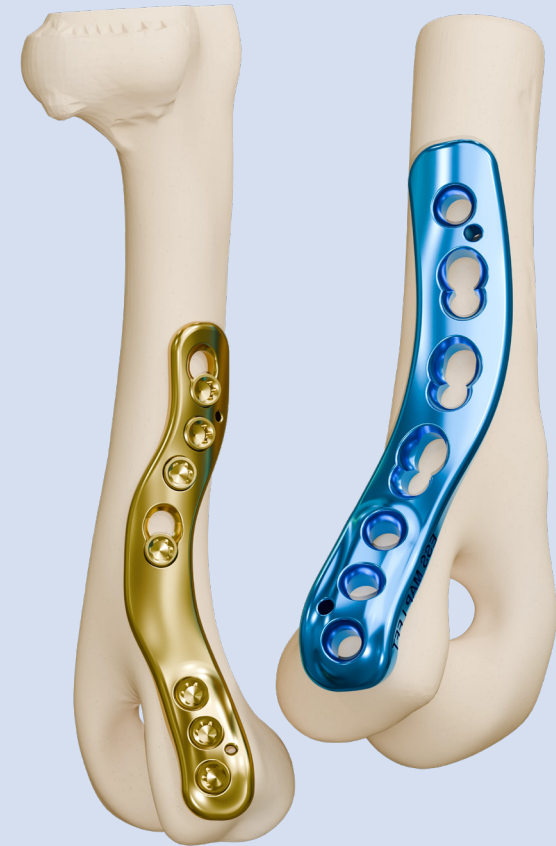
MEDIAL ANATOMICAL PLATE
(for Canine Elbow)

SURGICAL PROTOCOL



1. Implant Variants

- **English Springer Spaniel (ESS) MAP (for medium and large breeds)**
 - Short and long versions (Left and Right).
 - Accepts 3.5 mm screws.
 - Requires 2.9 mm drill bit and T10 screwdriver.
- **French Bulldog (FBD) MAP (for small breeds)**
 - Short, medium, and long versions (Left and Right).
 - Accepts 2.4 mm or 2.7 mm screws.
 - 2.4 mm locking screws: 1.9 mm drill bit, T8 screwdriver.
 - 2.7 mm locking screws: 2.1 mm drill bit, T8 screwdriver.
- **Design Rationale:** Based on morphologic and biomechanical data from ESS and FBD, but suitable for dogs of similar size. Plates are designed to match the morphology of the humeral condyle.



2. Plate Design

- **General Features**
 - Carefully pre-contoured distal end: curves cranially and over caudal aspect of medial epicondyle for maximum bone purchase.
 - Sits more cranially than a straight plate, allowing for improved bone purchase with less risk of joint surface impingement.
 - Midsection has a caudal “scoop” contour to minimise conflict with lateral plate (eg LEAP) screws when managing dicondylar (Y/T) fractures.
- **Hole Configuration**
 - Combination of locking holes and locking compression holes. This allows flexibility to place lag-screws through the plate and across the fracture, and to direct screws to avoid conflict with other components of dicondylar (Y/T) fracture stabilisation.
 - Temporary fixation options: K-wires or partially threaded olive pins/ stay-fix pins.
 - Dense screw distribution at distal end: generally allows for at least 3 screws distal to fracture site, even for distal fractures.



3. Screw Placement and Order

It is recommended to place as many screws in each fragment as anatomy and fracture configuration allows, with a minimum of two locking screws in each fragment.

- **Step 1: Lag Screw across fracture** (if indicated)

- For long oblique medial fractures, place trans-fracture lag screw first, if using.

- **Step 2: Distal Fixation**

- Insert 1–2 screws distally (3 holes available).
- Take care to avoid:
 1. Intra-articular screw exit.
 2. Conflict with transcondylar implants.
 3. Olecranon fossa/anconeal process penetration.
- **Tips:**
 1. Flex elbow during drilling to disengage anconeal process.
 2. Use pre-op CT or radiographs to determine “safe” drilling depth.
 3. Subtract up to 2mm from measured tunnel length to avoid intra-articular protrusion.
 4. After screw placement, check range of motion and palpate for crepitus associated with screw protrusion. Apply external rotation (pronation) of anti brachium during flexion/ extension to press the anconeal process against the axial surface of the medial epicondyle and confirm no conflict.

- **Step 3: Dynamic Compression** (if required)

- Use locking compression holes with 2.5 mm drill bit and cortical screws.
- Place screws with dynamic compression guides (arrow points toward fracture).
- Add +4 mm to measured tunnel depth when measuring with Fusion depth gauge (note, the Fusion depth gauge measures the actual depth of the tunnel, whereas some depth gauges add 2mm).
- Remove temporary fixation pins before final tightening to allow compression if appropriate.

- **Step 4: Managing co-placement with lateral fixation**

- The MAP is designed to minimise the risk of conflict with the screws or plate when using the Fusion LEAP.
- If using other lateral fixation methods, or LEAP position has been adapted according to anatomic variation or fracture configuration, strategies to manage conflict might include:
 1. Use of mono-cortical locking screws in either lateral plate, MAP or both.
 2. Use of cortex screws to allow for angulation.

3. Strategic screw placement, leaving some screw holes empty in either MAP, lateral plate, or both, where impact on construct stability will be minimal.
- **Final Screw Strategy:** Remainder of fixation determined by fracture configuration and surgeon preference

5. Key Intraoperative Safety Checks

- Confirm screw depth before full insertion.
- Test elbow through full flexion/extension for impingement.
- Check antebrachium external rotation to ensure the anconeal process does not catch.
- Reassess plate-bone conformity before tightening all screws
- MAP Protocol

Summary

The Medial Anatomic Plate (MAP) provides anatomic fixation for distal humeral fractures in dogs. Its contoured design improves distal purchase, minimises the risk of articular surface compromise, and allows flexible fixation strategies. Careful screw sequencing, preoperative planning, and intraoperative range of motion testing are important to optimise stability and minimise the risk of complications.

