

TRAUMA

Nonunion and malunion

Assessment and reconstruction when a fracture fails to unite or heals in a position that causes functional problems.

Patient information, treatment choices, risks, recovery and a space to record your individual plan.

Understanding the problem

Nonunion means that a fracture has failed to heal; delayed union means healing is taking longer than expected. Malunion means the bone has healed in an altered position, potentially affecting alignment, length or joint loading. Symptoms may include persistent pain, instability or a limp. Assessment uses your history, examination and serial X-rays, sometimes CT. Blood tests and, where appropriate, tissue samples help investigate infection or other contributors.

Treatment and the procedure

Treatment addresses both stability and the biology of healing. Options may include continued protection, selected bone-stimulation treatment or revision fixation with bone grafting. Infection can require tissue removal, antibiotics and staged reconstruction. A symptomatic malunion may need an osteotomy, in which the bone is cut and realigned, then stabilised with internal fixation or a frame. Not every malunion needs surgery. Complex bone loss or deformity may need specialist limb reconstruction.

Benefits, risks and expectations

If surgery is planned, discuss bleeding, anaesthetic risks and complex regional pain syndrome as well as the risks specific to your injury. Your general health and the extent of surgery affect your personal risk.

- The aim is a healed, more stable and functional limb with improved alignment where necessary. Pain relief and full restoration of function cannot be guaranteed.
- Discuss infection, bleeding, nerve or vessel injury, stiffness, blood clots, further nonunion, residual deformity and additional operations. Bone graft taken from your body introduces a separate harvest site with its own risks.
- Treatment can be lengthy, particularly with infection or a frame. Multiple procedures and changes to the initial plan may be necessary.

RECOVERY AND YOUR CONSULTATION

Nonunion and malunion

Use this guidance to prepare your individual plan with the treating team.

Rehabilitation and aftercare

Follow written loading, exercise, wound and pin-site instructions. Do not adjust a frame unless the reconstruction team has specifically taught and prescribed the adjustment. Imaging and clinical review guide progression. Physiotherapy maintains permitted joint movement and builds function as healing allows. Discuss smoking cessation, nutrition, diabetes control and medication review with the team. Plan practical help and work adjustments, and raise difficulties early.

When to get urgent help

- Seek urgent review for spreading redness, pus, fever, sudden new instability or worsening pain. A cold limb, new weakness or sudden severe pain needs A&E assessment.
- New calf pain or swelling needs urgent advice. Call 999 for chest pain or breathlessness.

Your consultation

Ask whether infection is suspected, which goals reconstruction can achieve, whether graft or a frame is proposed and how many stages are anticipated. Personalised consent includes alternatives and the consequences of deferring treatment.

Sources and further reading

AAOS: Nonunions

<https://www.orthoinfo.org/diseases--conditions/nonunions/>

Oxford University Hospitals: Non-healing fractures

<https://www.ouh.nhs.uk/limbreconstruction/information/conditions/non-healing-fractures/>

Oxford University Hospitals: Limb deformity

<https://www.ouh.nhs.uk/limbreconstruction/information/conditions/limb-deformity/>

Oxford University Hospitals: Limb reconstruction treatment

<https://www.ouh.nhs.uk/limbreconstruction/information/treatment/>

NHS: Deep vein thrombosis

<https://www.nhs.uk/conditions/deep-vein-thrombosis-dvt/>

NHS: Compartment syndrome

<https://www.nhs.uk/conditions/compartment-syndrome/>

CLINICIAN-COMPLETED WORKSHEET

Your consent discussion

Nonunion and malunion

This blank worksheet is not an executed consent. Complete it after clinical assessment with the treating clinician. The hospital or clinic must also complete its required consent process before treatment.

Patient name / identifier, date of assessment and communication support needed

Diagnosis, affected side / site and the proposed procedure or treatment

Reasonable alternatives discussed, including the option of no treatment

Expected benefit for this patient, limits of treatment and uncertainties

Material risks and personal risk factors - record the risks that matter to this patient

Patient's priorities, questions, understanding and agreed decision / time to consider

Treating clinician name, role and signature / date

Patient / representative name, signature and date - acknowledgement of discussion only

A signature here records a discussion; it does not replace a completed treatment consent form. You may ask further questions or change your decision before treatment.

CLINICIAN-COMPLETED WORKSHEET

Your rehabilitation and aftercare plan

Nonunion and malunion

Complete this plan after assessment. The advice must match your injury or operation, imaging, wound and medical history. Do not start limb loading, remove protection or change medicines using an uncompleted worksheet.

Limb loading / weight bearing, walking aids, sling / cast / boot / brace and protection

Wound / dressing care, bathing, elevation and swelling advice

Medicines, pain relief, clot prevention and any treatment-specific restrictions

Exercises, physiotherapy, range of movement and progression criteria

Work, driving, sport and daily activities - individual restrictions / review points

Review date, imaging / tests, named clinician and routine / out-of-hours contact details

Clinician completing this plan, signature / date and patient questions

When to seek urgent help

Seek urgent review for spreading redness, pus, fever, sudden new instability or worsening pain. A cold limb, new weakness or sudden severe pain needs A&E assessment. New calf pain or swelling needs urgent advice. Call 999 for chest pain or breathlessness.