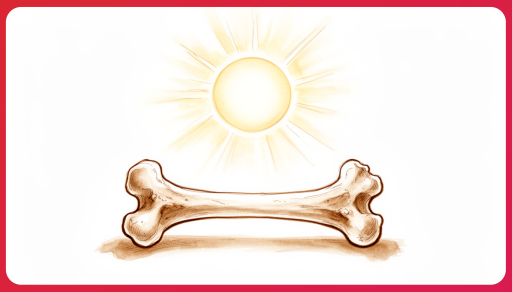
CQ HAND + UPPER LIMB
SPECIALIST ORTHOPAEDIC SURGEON

PATIENT INFORMATION

Vitamin D and Musculoskeletal Health



Vitamin D, the 'sunshine vitamin', is essential for bone strength and muscle function.

What it is

Vitamin D is a nutrient that helps your body use calcium to keep bones strong. It also plays a role in muscle function and healing. Your doctor may check your vitamin D levels before surgery to ensure your body is ready to recover. This is especially important if you are having hip fracture surgery or joint replacement.

Low vitamin D levels are linked to a higher risk of bone injuries. For example, deficiency is associated with increased odds of anterior cruciate ligament tears and reconstruction failure. It is also linked to stress fractures in athletes and military personnel. In older adults, deficiency is more common in winter and can affect bone health. Screening for deficiency helps guide preventive strategies for these groups.

Vitamin D may support tendon healing, particularly in rotator cuff repair. Evidence for this is currently low quality and limited to one tendon group. However, correcting deficiency before surgery can help prevent delayed wound healing. Administering a single large dose of vitamin D before joint replacement may positively impact outcomes. Active vitamin D3 treatment also promotes fracture healing by affecting immune factors in the body.

Your doctor might recommend screening if your vitamin D level is below 20 ng/mL. This is common in patients undergoing hip fracture surgery under general anesthesia. For arthroscopic rotator cuff repair, nonselective supplementation is often more cost-effective than testing everyone first. This approach saves money on blood tests while ensuring patients get the nutrients they need. Regular supplementation significantly reduces the likelihood of deficiency in arthroplasty patients.

In children, hand grip strength, vitamin D status, and diet are predictors of bone health. Targeted interventions can optimize musculoskeletal and metabolic health in adolescents. For most patients, maintaining adequate vitamin D levels supports overall musculoskeletal health and recovery.

CQ HAND + UPPER LIMB
Dr Kieran Hirpara — Specialist Orthopaedic Surgeon
Suite 2, Level 1, Mater Private Hospital Rockhampton, 31 Ward Street, The Range, QLD 4700
Phone 07 4863 6556 · office@cqupperlimb.com.au · cqupperlimb.com.au

Does it work?

The evidence on vitamin D is mixed. It clearly helps correct low levels in your blood. It may also support bone strength and healing after certain surgeries. However, it is not a magic cure for every injury or pain.

For joint replacement patients, vitamin D plays a clear role. If you have low levels before surgery, your doctor may recommend supplements to help your body heal. Some studies show that correcting deficiency before total knee or hip replacement can improve early recovery and lower complication rates. One approach involves a single large dose of 300,000 U to correct deficiency quickly. This can positively impact outcomes after primary total joint replacement. Another study found that giving 50,000 international units on the day of surgery did not significantly change early function or complications compared to a placebo. So, timing and dosage matter.

Vitamin D is also linked to bone health in other ways. Regular supplementation reduces the likelihood of deficiency in joint replacement patients. For those with osteoporosis, combining vitamin D with high-intensity interval training offers greater benefits for bone density than either alone. In adolescents, deficiency is linked to adverse body composition, so targeted interventions are important. For older adults, awareness of vitamin D needs after fragility fractures remains low, though guidelines are improving.

Injury prevention is less certain. While low vitamin D is associated with a higher risk of anterior cruciate ligament tears and stress fractures, more research is needed to confirm if supplements prevent these injuries in athletes. Evidence for tendon healing, such as in rotator cuff repairs, is limited and of low quality. It may help, but we need more studies to be sure.

Overall, checking your vitamin D levels is a smart step. It helps your doctor tailor a plan for you. Whether you need a small daily dose or a larger corrective dose depends on your specific needs and the surgery you are having.

Is it right for you?

You may benefit from checking your vitamin D levels if you are an athlete, military personnel, or an older adult. Low levels are linked to a higher risk of knee ligament tears and stress fractures. Your doctor might recommend testing before hip or knee replacement surgery. This is especially true if you are having surgery in winter or have a history of fragility fractures. Correcting a deficiency before joint replacement can help your body heal better.

If you are having rotator cuff repair or carpal tunnel release, your doctor may check your levels to prevent slow wound healing. For knee replacement patients, taking vitamin D helps maintain healthy levels. However, only 33.7% of deficient patients reached healthy levels with standard medium-to-high dose supplements. You might need a single large dose of 300,000 U to correct a deficiency quickly. This approach can improve outcomes after primary total joint replacement.

You probably will not see major benefits if you are a healthy elite athlete without a known deficiency. More research is needed to prove that supplements reduce injury risk in this group. Also, while exercise and vitamin D together help bone density in women with osteoporosis, the evidence for tendon healing remains limited.

CQ HAND + UPPER LIMB
Dr Kieran Hirpara — Specialist Orthopaedic Surgeon
Suite 2, Level 1, Mater Private Hospital Rockhampton, 31 Ward Street, The Range, QLD 4700
Phone 07 4863 6556 · office@cqupperlimb.com.au · cqupperlimb.com.au

The main downside is that supplements may not fully correct a severe deficiency on their own. Giving supplements to everyone is often more cost-effective than testing everyone first, because the pills are cheaper than blood tests. Talk to your doctor about whether testing or direct supplementation is right for your specific situation.

The bottom line

Your doctor may check your vitamin D levels before surgery to help your bones and healing. Taking supplements can lower the risk of complications and improve recovery after joint replacement. However, results vary. Only 33.7% of deficient patients reached healthy levels with standard doses. More research is needed to confirm benefits for athletes and tendon repairs. Ask your doctor if testing or supplementation is right for you.

CQ HAND + UPPER LIMB
Dr Kieran Hirpara — Specialist Orthopaedic Surgeon
Suite 2, Level 1, Mater Private Hospital Rockhampton, 31 Ward Street, The Range, QLD 4700
Phone 07 4863 6556 · office@cqupperlimb.com.au · cqupperlimb.com.au