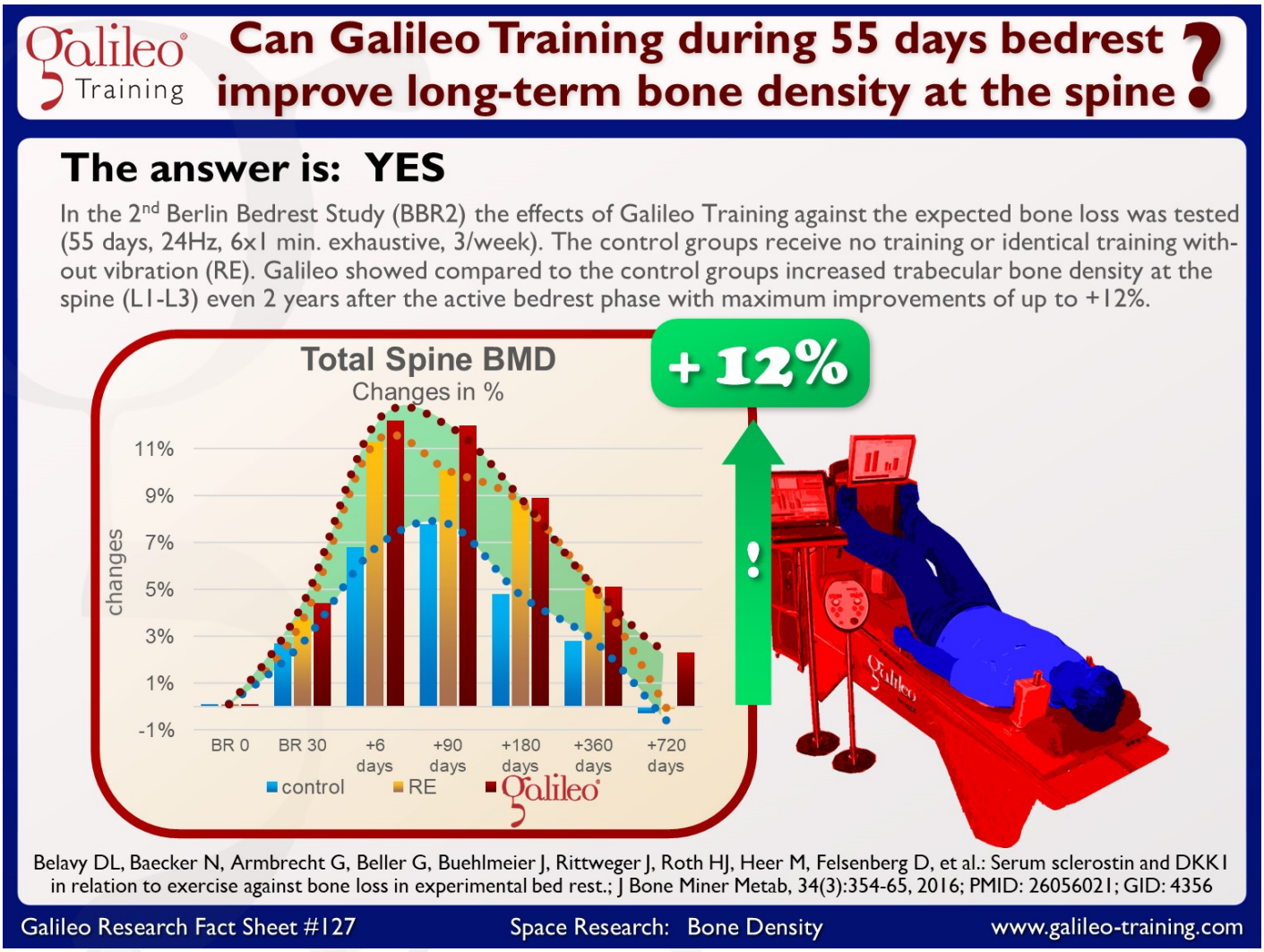

The 2nd Berlin Bed rest Study (#BBR2) was the second big space research study where Galileo Training was used as a counter measure against negative effects of simulated micro gravity on muscle and bone.

This time two control groups (no training (CG) and identical training but without Galileo vibration (RE)) were used. #BBR2 was very successful again.

Using an improved Galileo Space system the effective training time of 50 Minutes in #BBR1 (#GRFS44, #GRFS45) could be reduced to 3 times 6 minute (18 minutes!) per week –

And showing almost as good effects as BBR1 (#GRFS68, #GRFS69, #GRFS87, #GRFS90, #GRFS93# GRFS104, #GRFS105)!

This example showed that even 2 years after the active bed rest period the bone density at the spine (L1-L3) could be improved by 2.3% - directly after the active bed rest period the gain was even up to 12%! –

Very effective and efficient at the same time, considering an active training time of just 18 minutes per week over 8 weeks!

J Bone Miner Metab. 2016 May;34(3):354-65. doi: 10.1007/s00774-015-0681-3. Epub 2015 Jun 9.

Serum sclerostin and DKK1 in relation to exercise against bone loss in experimental bed rest.

Belavý DL[1,2], Baecker N[3,4], Armbrecht G[5], Beller G[5], Buehlmeier J[3,4], Frings-Meuthen P[4], Rittweger J[4], Roth HJ[6], Heer M[7], Felsenberg D[5].

The impact of effective exercise against bone loss during experimental bed rest appears to be associated with increases in bone formation rather than reductions of bone resorption. Sclerostin and dickkopf-1 are important inhibitors of osteoblast activity.

We hypothesized that exercise in bed rest would prevent increases in sclerostin and dickkopf-1.

Twenty-four male subjects performed resistive vibration exercise (RVE; n = 7), resistive exercise only (RE; n = 8), or no exercise (control n = 9) during 60 days of bed rest (2nd Berlin BedRest Study).

We measured serum levels of BAP, CTX-I, iPTH, calcium, sclerostin, and dickkopf-1 at 16 time-points during and up to 1 year after bed rest.

In inactive control, after an initial increase in both BAP and CTX-I, sclerostin increased. BAP then returned to baseline levels, and CTX-I continued to increase.

In RVE and RE, BAP increased more than control in bed rest ($p \leq 0.029$). Increases of CTX-I in RE and RVE did not differ significantly to inactive control.

RE may have attenuated increases in sclerostin and dickkopf-1, but this was not statistically significant. In RVE there was no evidence for any impact on sclerostin and dickkopf-1 changes.

Long-term recovery of bone was also measured and 6-24 months after bed rest, and proximal femur bone mineral content was still greater in RVE than control ($p = 0.01$).

The results, while showing that exercise against bone loss in experimental bed rest results in greater bone formation, could not provide evidence that exercise impeded the rise in serum sclerostin and dickkopf-1 levels.

PMID: 26056021 DOI: 10.1007/s00774-015-0681-3