

**Table 2**

Derived osteocyte network quantities for the human skeleton.

| Description (abbreviation)   | Formula   | Value  |
|--|---|--|
| Osteocyte density (N.Ot/BV)  | $(N. Ot/N. Lc) \times (N. Lc/BV)$   | 19,000–28,500 mm <sup>-3</sup>                                       |
| Total number of osteocytes (Tt.N.Ot)                               | $(N. Ot/BV) \times BV$  | 41.6 × 10 <sup>9</sup> (~42 billion)                                 |
| Total number of lacunae (Tt.N.Lc)                                  | $(N. Lc/BV) \times BV$  | 43.8 × 10 <sup>9</sup> (~44 billion)                                 |
| Total number of osteocyte dendritic processes (Tt.N.DP)            | $Tt. N. Ot \times (N. DP/Ot)$   | 3.7 × 10 <sup>12</sup> (3.7 trillion)                                |
| Total number of osteocyte connections (Tt.N.Ot.Cx)                 | $(N. Cx/DP) \times (N. DP/Ot) \times Tt. N. Ot/2$                             | 23.4 × 10 <sup>12</sup> (~23 trillion)                               |
| Number of terminal connections per osteocyte (N.Cx/Ot)             | $(N. Cx/DP) \times (N. DP/Ot)$  | 1128   |
| Number of terminal connections per dendritic process (N.Cx/DP)     | $\frac{1}{(t)} + \left(1 - \frac{1}{(t)}\right) \frac{(Tt.DP.L/DP)}{(t)}$     | 12.7   |
| Total cumulated length of osteocyte dendritic processes (Tt.DP.L)  | $(Tt. DP. L/BV) \times BV$  | 175,000 km   |
| Cumulated length of osteocyte processes per osteocyte (Tt.DP.L/Ot) | $\frac{(Tt.DP.L/BV)}{(N.Ot/BV)}$  | 4.2 mm   |
| Cumulated length of a single osteocyte process (Tt.DP.L/DP)        | $\frac{(Tt.DP.L/BV)}{(N.Ot/BV) \times (N.DP/Ot)}$                             | 47 μm  |
| Total lacuno-canalicular system surface area (Tt.LCN.S)            | $Lc. S \times Tt. N. Lc + 2\pi \times Ca. Rd \times Tt. DP. L$                | 215 m <sup>2</sup>   |
| Total lacuno-canalicular volume (Tt.LCN.V)                         | $Lc. V \times Tt. N. Lc + \pi \times Ca. Rd^2 \times Tt. DP. L$               | 35.8 cm <sup>3</sup>   |
| Lacuno-canalicular porosity  | $\frac{Tt.LCN.V}{BV}$   | 2.05%  |
| Total extracellular lacuno-canalicular volume (Tt.EC.LCN.V)        | $Lc. S \times g \times Tt. N. Lc + \pi(Ca. Rd^2 - DP. Rd^2) \times Tt. DP. L$ | 24.2 cm <sup>3</sup>   |
| Number of osteocytes replaced per unit time                        | $Rem. R \times (N. Lc/BV)$  | 3.33 × 10 <sup>9</sup> cells/year<br>9.1 × 10 <sup>6</sup> cells/day |