**Table 2.1** Mechanical properties of metallic biomaterials. Small variations in E may be attributable to different measuring methods. The large range of strength and % elongation to failure properties are due to different material processing. Some polymer and ceramic, as well as cortical bone properties are shown for comparison

| Material | E (GPa) | $\sigma_{yield}$(MPa) | $\sigma_{ult}$(MPa) | % elong |
|---|---|---|---|---|
| Fe-based | 200–205 | 170–690 | 540–1000 | 12–40 |
| Co-based | 220–230 | 450–1500 | 655–1900 | 5–30 |
| CP Ti | 100–115 | 170–480 | 240–550 | 15–24 |
| Ti-based | 100–110 | 585–1050 | 690–1150 | 10–15 |
| Ta | 188 | 140–345 | 205–480 | 1–30 |
| Ni-Ti (Ms) | 28–41 | 70–140 | 895 | ~9 |
| UHMWPE | 0.5 | – | ~3 | 800 |
| $Al_2O3$ | 350–380 | – | 400 (flexural) | – |
| PS-$ZrO_2$ | 200 | – | 800 (flexural) | – |
| Bone (cortical) | 10–20 | – | 100–300 | 1–2 |