

Longitudinal growth of healthy preterm infants born below 37 gestation weeks

Niina Hyvönen^{1,2}, Panu Kiviranta³, Antti Saari³, Leo Dunkel⁴, Ulla Sankilampi³

¹Central Finland Central Hospital, ²University of Eastern Finland, ³Kuopio University Hospital, ⁴Queen Mary University of London

Disclosure statement:
Nothing to disclose



Background

Existing preterm growth charts are based on cross-sectional birth size data, and fail to describe postnatal longitudinal growth adequately.

Objective

We describe the normative growth of healthy preterm infants under contemporary neonatal care from birth to term equivalent age (TEA).

Methods

The initial study population consisted of 3,055 preterm infants born below 37 gestation weeks (GW). Perinatal risk factors* for abnormal pre- or postnatal growth were excluded. Longitudinal growth was summarized as median growth curves.

Gestation week groups	The final study population (n=1,303)
24-27+6	80
28-31+6	169
32-36+6	1,054

*Exclusion criteria: In vitro fertilization, smoking, maternal hypertension and diabetes, congenital malformation, severe neonatal illness (e.g. BPD, NEC), birth weight or length <-2SD or >2SD, twins born ≥28 GW, triplets

Results

After birth, catch-down growth in SD units occurred in all GW groups except in length in infants born at 32-36 GW. Typically, catch-up growth started after 34 postmenstrual weeks.

Gestation weeks	Weight (boys/girls) Percentage <-2SD	Length (boys/girls) Percentage <-2SD
24-27+6	-2.0 SD / -1.8 SD 36 % / 39 %	-2.3SD / -1.8 SD 56 % / 37 %
28-31+6	-0.6 SD / -0.5 SD 12 % / 7 %	-0.4 SD / -0.3 SD 9 % / 2 %
32-36+6	-0.6 SD / -0.5 SD 1 % / 2 %	-0.1 SD / 0.2 SD 0.4 % / 0.4 %

Table 1: Median weight SD, length SD and the percentage of infants <-2SD at term equivalent age. Growth data were converted to SD using contemporary birth size references.

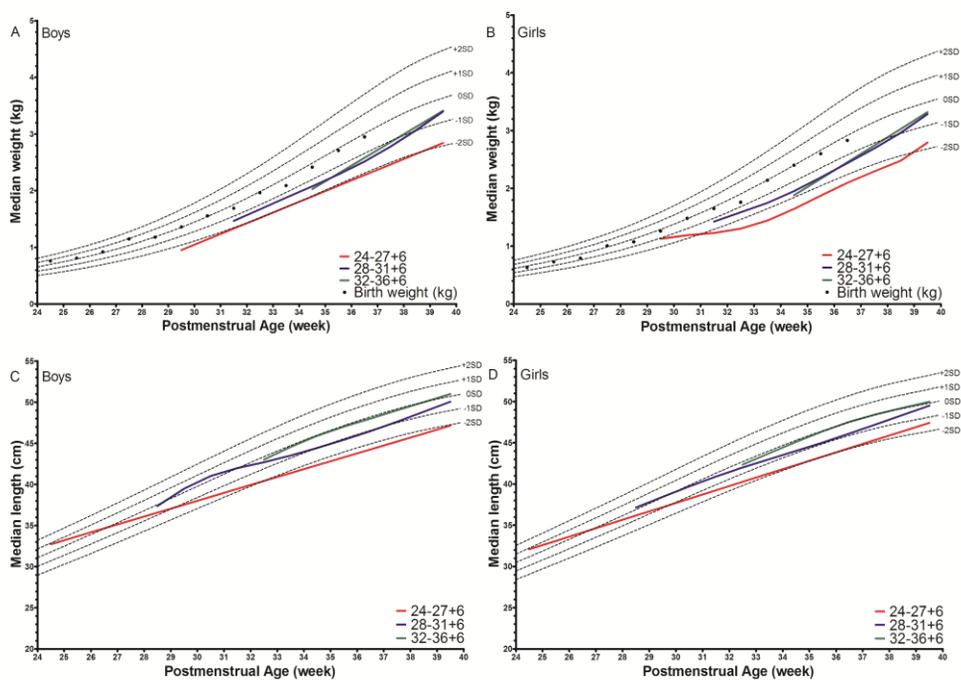


Figure 1: Longitudinal growth references for healthy preterm infants born 24-27 (red), 28-31 (blue) and 32-36 gestation weeks (green) in postmenstrual age in weight (A,B) and in length (C,D), genders separately. Finnish birth weight and length references are plotted as dashed lines. Weight measurements within the first two weeks are not plotted.

Conclusion

Despite modern neonatal care, still 30-40% of the healthy extremely preterm infants have extrauterine growth failure at TEA when compared to growth in utero. However, the ideal growth pattern of extrauterine growth in preterm infants may not be the same as the growth in utero.