Author's response to reviews

Title: A new growth chart for preterm babies: Babson and Benda's chart updated with recent data and a new format

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Cover letter, revised version of: "A new growth chart for preterm babies: Babson and Benda's chart updated with recent data and a new format"

I thank the reviewers for their thoughtful and helpful suggestions which I have addressed below and revised in the manuscript.

Reviewer: Stephanie Atkinson

a) Discretionary revisions
1. The dating of gestational ages by ultrasound by the first source was not well described. Response: This has been improved in Table 1.
2. The comment on the format of Niklasson head circumference needs to be clarified. Response: The description of the mathematical function to describe their data has been clarified with the terminology used by the authors i.e. "third degree polynomial function".
3. The body composition of term infants has been evaluated. Response: Thank you for the reference regarding term infant body composition having been documented. This technique is used for research and is not used routinely as an evaluation of growth. I have changed the sentence referring to body composition from "The optimum body composition of the growing preterm infant is not known and growth charts provide no assessment of body composition." to "The optimum body composition of the growing preterm infant is not known nor easily measured. Current growth charts provide no assessment of body composition."

Compulsory revisions
4. The noun data has been corrected into its plural form.
5. Thank you for the suggestion of a table to list the details of the source studies (Table 1). This has been added and has permitted numerous descriptive statements to be removed from the text.

Reviewer: Gerd G Schmalisch

I thank Dr Schmalisch for his eloquent description of the limitations of this meta-analysis. Major points:
1. Concern was raised regarding homogeneity of the source populations. Response: This issue has now been dealt with in the Discussion: the validity of a meta-analysis is affected by methodological quality of the individual studies and the extent of heterogeneity in the studies and their results. It would have been preferable if all the data could have been obtained from one study with uniform methodology. The a priori criteria did limit the studies to those that were population based, had large sample sizes and recorded gestational age in completed weeks. The studies used were all from
developed countries where the majority of women are well nourished and the three studies used for 
the preterm section have publicly funded universal health care. The studies have slight differences 
in the inclusion and exclusion criteria which could have influenced their results. The most notable 
differences between the studies were the exclusion of multiple births from the Swedish and 
Australian surveys and the statistical adjustment of the Canadian survey data. There is evidence that 
the birthweight of infants from multiple gestations are reduced relative to the weight of singletons 
after 30 weeks of gestation. The consistency of the results of the two sources of head circumference 
and length data was remarkable, which suggests that the differences between these two studies 
were not substantial.

2. Concern was expressed about the weighed averaging for the head circumference and length 
data, which is a rough estimate of the exact percentiles of the pooled population. The percentiles 
must be determined non-parametrically. Response: I agree that ideally the combining of these two 
data sources would have been done with the raw data to create one distribution for each gestational 
age, however this was not possible from the published data. Since the sample sizes were very 
different (380,000 vs 30,000), the resulting weighted averages (30 through 40 weeks) were 
predominantly influenced by the Swedish data. The head circumference and length curves are only 
Australian data prior to 30 weeks. Therefore the influence of the weighted average process is 
minimal.

3. Concern was expressed that the total sample size does not give any information about the 
number of infants in the different age groups particularly in the upper and lower percentile range. 
Response: I agree with this comment but feel that this is not a big concern in this situation because 
of the close agreement of the two sets of data. The data were very similar which would have 
permitted the use of the Swedish data to follow the Australian data without the weighted averaging 
procedure. The smoothing would have then corrected the over-curvature of the Swedish curves and 
the end result would have been the same.

4. Concern was expressed that intrauterine and postnatal growth differ and that there is not likely a 
simple transition from fetal to postnatal growth. I agree that the pattern of preterm infant growth is 
likely to be different than the somewhat arbitrary smoothing that was done for this chart from the 
decelerating intrauterine curves to meet the post term curves prior to the 2 month measurement, 
however, a better pattern for this smoothing is not known at this time.

5. Concern was expressed regarding the disjunctions between the data sets and the need for a 
validation study was discussed. Response: I agree with these comments and have added a mention 
of the need for a validation study: To confirm that these curves and the smoothing process that was 
used are applicable as a growth chart for preterm infants requires a validation study. The ideal 
validation study would compare the growth of a population of healthy preterm infants followed 
prospectively from birth though 50 weeks post-conceptual age. Healthy infants should be used to 
decrease the chance of bias due to illness of prematurity, however it would be useful to also 
document the growth patterns of unwell infants on this growth chart.

Minor points
1. Abstract line 6: "based on larger sample sizes", suggest change to "based on a meta-analysis". 
Response: Changed as suggested
2. Omit figure 1 and figure 2. Response: Omitted as suggested
3. Reduce the comparison of the new chart with Babson's. Delete either the tables 1-3 or Figure5. 
Response: Deleted the tables 1-3.
4. The legend of Table 4 is difficult to understand. Response: Legend has been shortened and 
clarified
5. There are many misspellings. Response: I haven't found any misspellings and I request 
clarification regarding which form of English is preferred by BioMed Central: British, American or 
Canadian?