**Background**: Modelling treatment effects is one of the opportunities offered by individual participant data (IPD) meta-analysis (MA). Analysing associations between outcomes and continuous patient characteristics may be challenging when non-linear associations are present. Here, splines seem to offer great flexibility but are rarely applied.

**Objective**:

To introduce modelling of nonlinear absolute treatment effects using restricted splines, B-splines, P-splines and Smoothing splines and different pooling methods in IPD-MA.

**Methods**: We describe splines and illustrate their performance in an artificial single study. We describe two-stage methods based on pointwise and multivariate meta-analysis and a one-stage method based on generalised additive mixed effects models (GAMMs) to pool the results of multiple studies. We illustrate their performance on three IPD-MA scenarios of five studies each: one where only the associations differ across studies, one where only the ranges of the effect modifier differ and one where both differ. We evaluated splines and pooling approaches in an empirical example, modelling the risk of fever and/or ear pain in children with acute otitis media conditional to age.

**Results**: Across the three IPD-MA scenarios results varied. Penalised splines were smoother than regression splines. In the first scenario, multivariate meta-analysis was most efficient, in the second and third scenario, pointwise meta-analysis was most flexible but showed non-smooth curves and GAMMs performed in between. In the empirical example, GAMMs especially combined with penalised splines was smoother and used all information available in contrast to pointwise and multivariate meta-analysis.

**Conclusion:** Splines provide a helpful tool to capture nonlinear treatment effect differences in IPD-MA.