



## SEVEN NUTRITIONAL PHASES AND SUBPHASES

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If diet is not properly managed, obesity in PWS typically begins between 2 and 4 years of age. As infants, there is almost an absence of an appetite drive. The appetite gradually increases in early childhood such that by about 8 years of age the individual with PWS is showing signs of an insatiable appetite (hyperphagia). Through studies, seven distinct nutritional phases and sub-phases have been identified.

The initial nutritional phase, phase 0, occurs *in utero* with decreased birth weight, length, and fetal movements. In the first phase the infant is hypotonic and not obese. Sub-phase 1a is characterized by poor appetite, feeding, and weight gain. Sub-phase 1b occurs when the infant is growing steadily along a growth curve and appears to be growing at a normal rate with an improving appetite.

The second main phase occurs when the weight starts to increase and crosses growth percentile lines. This generally begins between 18 and 36 months of age. Sub-phase 2a is when the child's weight increases such that they cross 1–2 or more growth percentile lines without a significant increase in calories. During this phase the children do not have an increased appetite or increased interest in food. Therefore, these observations indicate that the precipitant for the onset of the early-onset obesity is not a result of hyperphagia, but rather a different etiology. Sub-phase 2b occurs when the child has increased their daily calories and has become more overweight/obese if the diet is not appropriately regulated. Individuals in this sub-phase have an abnormally increased appetite and interest in food and typically food seek, but do not yet have the insatiable appetite and frequent food seeking exhibited in phase 3.

The third phase is the development of an insatiable appetite accompanied by aggressive food-seeking. This is the classical phase that most people typically associate with PWS, but its onset is quite variable in PWS. It may appear as early as 3 years of age or as late as 15 years. In fact, a small minority of individuals with PWS never do go into this phase. The fourth phase occurs in adulthood when an individual who was previously in phase 3 no longer has an insatiable appetite and can feel full. Families and care takers note a significant improvement in appetite and weight control. Most adult individuals with PWS have not yet entered this phase and may never do so.

Food security and environmental controls are needed and enforced based on the nutritional phases.