

# Atypical Body Composition in Individuals with Prader-Willi Syndrome

**Prader-Willi syndrome (PWS)** is a rare genetic disorder (~1 in 15,000 births) and the most common genetic cause of syndromic obesity<sup>1,2</sup>

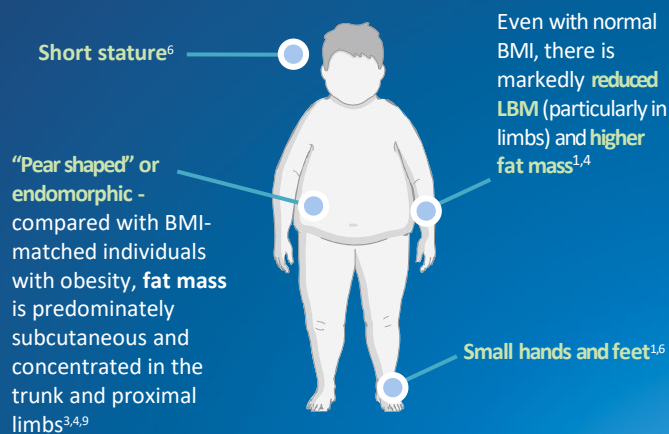
- Individuals with PWS have an intrinsic **atypical body composition** characterized by **increased fat mass** and **reduced lean body mass (LBM)**, evident from infancy and persisting into adulthood, even among those with normal BMI<sup>1,3-5</sup>
- Hyperphagia, as well as obesity**, are among the clinical conditions of PWS that may typically develop in childhood and, if present, can each further impact body composition.<sup>3,4,6-8</sup>
- Not all individuals with PWS are obese**; excessive weight or obesity affects ~40% of children/adolescents and ~80-90% of adults.<sup>3,8</sup> However, in PWS individuals who are obese, PWS body composition remains distinct from non-syndromic obesity: compared to BMI-matched obese individuals, PWS is characterized by **elevated total and subcutaneous fat mass, reduced LBM, and lower resting energy expenditure**.<sup>2-4,8,9</sup>

## Etiology of PWS

- PWS results from loss of paternally expressed genes on chromosome 15q11.2–q13.<sup>2,3</sup>

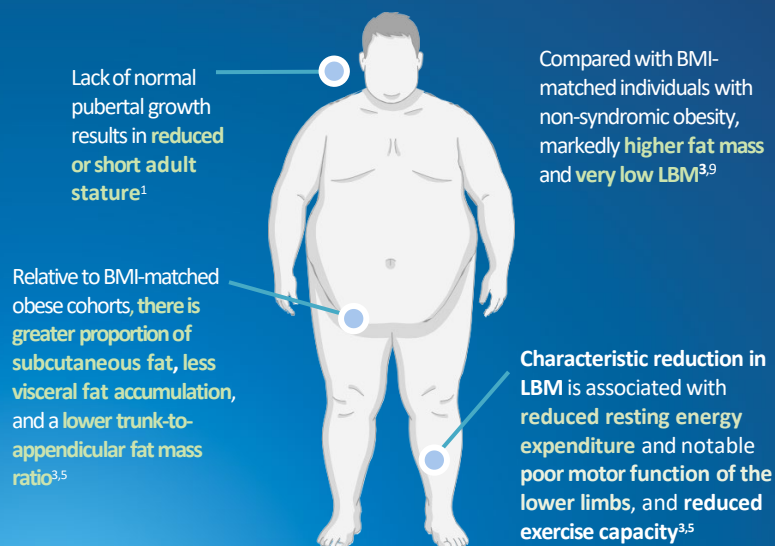
## Phenotypes of Individuals with PWS\*

### Children with PWS



- Infants with PWS, even when underweight, exhibit elevated body fat<sup>1</sup>

### Adolescents & Adults with PWS



\*Conceptual schematic informed by recent PWS publications; illustrative only and not based on Soleno data

## Key Body Composition Parameters in PWS

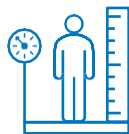
- Anthropometric indicators like **weight** or **BMI** provide limited insights into body composition in **PWS**, particularly in children and adolescents whose growth patterns differ.<sup>4,7</sup> Additional parameters offer a more accurate clinical view of the body-composition patterns across developmental stages and qualitative shifts in PWS.

### Weight



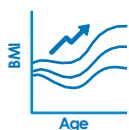
- Measures total body mass, not quality of tissue<sup>4</sup>

### BMI



- May appear 'normal' despite excess fat and low muscle mass<sup>4</sup>

### BMI Z-score



- Age/sex-standardized BMI- useful for tracking trajectories in pediatrics, relative to peer cohort

### Lean body mass



- LBM = total body weight minus fat mass**; (muscle, bone, water, organs)

### Fat mass



- Total adipose tissue = total body weight minus LBM**

### Lean mass index



- Lean tissue metric that adjusts for stature: **LMI = LBM ÷ height**

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