

Hand-Wrist Growth X-Rays

How do skeletal growth indicators help in orthodontic planning?



You may wonder why we take a hand-wrist x-ray on girls beginning at age 9 and boys beginning at age 11. This x-ray gives us a snapshot of your child's Skeletal Maturation Index, or SMI.

What is SMI?

SMI ranges from stage 1 to stage 11. There is a considerable variation in the chronologic age at which a child reaches developmental milestones, so we look at skeletal growth and not chronologic age to determine how much adolescent growth they have left at a particular moment in time. When a person reaches SMI 4, a small, pea shaped bone called the sesamoid bone presents on the x-ray next to the thumb. The sesamoid bone indicates that the person has entered their adolescent growth spurt. The width of the finger bones and closure of growth plates indicate in between stages and when a person reaches SMI 11 their wrist bone fuses. This indicates they are done growing and have reached their full adult height.

How does growth relate to orthodontics?

The palate, or roof of your mouth, is a bone that develops in two pieces with a soft spot or suture located in the middle of the roof of your mouth where the two pieces of bone join. It remains that way until a person reaches SMI 11, at which time the bone fuses. During growth when the palate is soft, orthodontic appliances can be used to widen the palate to make room for permanent teeth. There are also certain appliances used in comprehensive treatment and Phase II treatment that work best when timed with growth. This x-ray is one tool that our practice uses to determine the **optimal time** for planning a patient's orthodontic treatment.