Improved diagnostics in apple allergy

– distinguish between pollen-related and LTP-dependent fruit allergy
Take the diagnosis and management of apple-allergic patients to a whole new level

Distinguish between pollen related apple allergy and fruit allergy due to LTP sensitization
The cause of apple allergy shows regional differences; it may be due to LTP sensitization or to grass-pollen cross reactivity in Southern Europe while in Northern and central Europe birch pollen related apple allergy is more common.¹,²

- Sensitization to Mal d 3 (an LTP protein) indicates a fruit allergy where peach is often the primary sensitizer.³,⁴
- The presence of IgE antibodies to profilin (e.g. Phl p 12) alone is indicative of a grass-pollen related apple allergy.⁵,⁶
- Sensitization to Mal d 1 (a PR-10 protein) is seen in birch-pollen allergic patients and is caused by cross-reactivity with the main birch allergen Bet v 1.⁴,⁷

Improve the risk assessment using allergen components
- Patients with IgE antibodies to Mal d 3 are at higher risk of developing systemic reactions.³
- Fruit allergic patients without concomitant pollinosis are at higher risk of systemic reactions.⁸,⁹
- IgE antibodies to Mal d 1 and/or profilin and not to Mal d 3 suggest that predominantly local oral symptoms may occur.²,³

Improve management of apple allergic patients
- Apple allergic patients sensitized to Mal d 3 may tolerate peeled apples.¹⁰
- In patients sensitized to Mal d 3, other fruits and nuts should be considered as potential causes of allergic reactions (peach, apricot, cherry, hazelnut, walnut etc.).⁴
- Apple allergic patients sensitized to Mal d 1 and/or profilin may often tolerate cooked apples.¹
Did you know that?

Regional differences:
- The prevalence of pollen related apple allergy in Northern and Central Europe is approximately 2%.
  Up to 80% of birch allergic patients have concomitant plant food allergies, where apple and hazelnut allergies are the most common.\(^{11}\)
- Fruit allergy driven by LTP-sensitization, common in Southern Europe, may lead to cross-reactivity with other fruits and nuts.\(^{12}\)
- Fruit allergy in Southern and Central Europe may also be a consequence of grass pollen cross-reactivity caused by profilin sensitization.\(^{5,6}\)

Symptoms and disease progression
- Allergic reactions in patients with sensitization to LTP range from oral allergy syndrome to severe anaphylaxis. Over time, the patient may react more severely to the same food.\(^{8,9}\)
- In pollen dependent food allergy the patient has initially suffered from pollinosis and later developed symptoms from eating plant derived foods such as apple.\(^{5,6}\)

Apple and its allergens
- LTP is localized predominantly in the fruit peel, but peeled fruit may also elicit reactions.\(^{13}\)
- PR-10 proteins are found mainly in the fruit pulp. These proteins are sensitive to heat and digestion, hence symptoms are commonly restricted to oral itching and most patients tolerate cooked apple.\(^{11}\)
- Different apple cultivars contain varying amounts of allergens.\(^{13}\)

*Profilins
Profilins are so similar across species, that any profilin may be used as a surrogate marker. If preferred profilin from birch (Bet v 2) or peach (Pru p 4) can be used instead.
References: