MOLAR HYPOMIN
A silent epidemic damaging 1 in 6 children’s teeth
What is Molar Hypomin?

Prof. Manton: Molar (Incisor) Hypomineralisation or Molar Hypomin (MIH), popularly known as ‘chalky teeth’, is a prevalent developmental condition amongst Australian children and adolescents. The condition ranges from very mild enamel lesions to severely affected enamel that breaks down once erupted into the mouth, creating difficulties in treatment planning, restorative treatment and gaining adequate analgesia.

What causes Molar Hypomin?

Prof. Manton: Research has produced lots of hints that the problem is something to do with illness in infants and that such disturbances (of the whole body) somehow damage the developing tooth. But we still don’t know which illnesses are the cause, however high temperatures and respiratory tract infections seem to be involved. All studies point to the cause being complex, so it seems likely that several things must act together to cause Molar Hypomin, rather than there being just one nasty culprit. Clearly, there is a strong need for more research in this area.

What do Hypomin Molars look like?

Prof. Manton: Hypomin Molars are weaker than normal, and about one third of affected teeth are very weak, discoloured and soft. Hypomin Molars are formed with less mineral, which makes them more prone to break down during chewing and tooth brushing. The commonest sign is creamy-yellow/brown or extra-white spots on a child’s teeth. You may see them on their 2-year-old molars and other primary teeth, and that could be a sign of trouble later when the adult molars come through, which are the teeth most at risk.
What are the important things to look for when diagnosing Molar Hypomin?

Prof. Manton: In any particular patient, the clinical appearance will depend, to a large extent, on how long the affected teeth have been erupted.

Generally, a Hypomin Molar is easiest to spot soon after it emerges into the mouth – that is, before complicating factors set in. For children aged between 2 and 3 years, we should look for opacities (opaque enamel or yellow/brown enamel) on primary molars. For children aged between 5 and 8 years, we should pay attention to opacities in the erupting first permanent molars and often the incisors as well. Hypomin Molars are at increased caries susceptibility and severe caries may be all that is apparent at later stages.

It is important to remember that the more severe the Molar Hypomin case is in the primary molars and/or in the first permanent molars, the more likely that the permanent incisors will be affected too.

In contrast to caries, which only affects teeth that have erupted into the mouth, Molar Hypomin happens when the tooth is developing within the child’s jaw – its cause has nothing to do with sugar and plaque. Once erupted, Hypomin Molars may start to break down, even without excess sugars or acids in the diet. So, it is particularly important that Hypomin Molars are looked after carefully to limit problems with dental caries.

Because such degradation of Hypomin enamel doesn’t happen before emergence, it is fundamentally incorrect to refer to it as Hypoplasia. Put another way, breakdown of Hypomin lesions represents an acquired deficit of enamel thickness, not a developmental one. Conversely, with Hypoplasia most enamel loss occurs before eruption, with any post-eruptive loss relatively minimal. Hence a key distinguishing feature of Hypomin is its relatively fast rate of change post-eruptively.

Early diagnosis is crucial, but once diagnosed, how can dentists treat Hypomin Molars?

Prof. Manton: Yes, the first point is early and accurate detection/diagnosis; this leads to correct treatment planning and treatment options. Most treatment for Molar Hypomin aims to protect the defective areas, thereby decreasing pain, further breakdown and subsequent decay.

An essential step is to assess the child’s caries risk, as we know outcomes worsen with increasing caries risk – if high risk, we discuss the factors involved including dietary and oral hygiene advice. We emphasise high risk for caries in a non-judgemental motivational interviewing kind of way.

We have found that a practical chair-side motivation tool between appointments is GC Tri Plaque ID Gel. The GC Tri Plaque ID Gel helps the identification of areas where the plaque has not been cleaned off. For example, the areas that appear light blue are of most concern, as these are areas where the plaque has been present for 48+ hours and a complex cariogenic biofilm has developed. This plaque is producing acids. The GC Tri Plaque ID Gel helps to educate children and parents about plaque that remains on the teeth after brushing and it also shows us how compliant they have been in terms of home care and reducing caries risk.

We know that early management of these teeth works. We are able to prevent the consequences of the condition from getting worse if we can identify it early, and put into practice measures such as tooth surface protection (e.g. GC Fuji VII or GC Fuji VII EP) to shield the teeth and enamel surface hardening using GC Tooth Mousse applied nightly or twice a day.

For the higher risk children – if the lesions are coloured (yellow/brown) – we would tend to seal the tooth with low viscosity glass-ionomer cement (GIC) (e.g. GC Fuji VII or GC Fuji VII EP), prescribe adult strength fluoride toothpaste and GC Tooth Mousse applied nightly or twice a day. We then follow them carefully so that early stages of post-eruptive breakdown are detected as soon as possible.

Depending on the degree of severity and compliance, the treatment with GC Tooth Mousse could be the preferred long term treatment strategy, or it may simply be a transitional step focused on patient comfort prior to extensive restorative treatment. Also by identifying the problem early, fillings can be performed rather than requiring more extensive procedures, such as crowns and/or tooth extraction.
Molar Hypomin Management

Home care is vital for strengthening Hypomin Molars and decreasing hypersensitivity:

- **GC Tooth Mousse** applied every evening or twice a day (in severe cases) after tooth brushing.
- Adult strength fluoride toothpaste twice a day.

Clinical Alerts

- Creamy-yellow/brown or extra-white opacities on a child’s 2-yr molars, 6-yr molars and (in more severe cases) permanent incisors and any other teeth.
- Unusual caries patterns – often restricted to first permanent molars and second primary molars, despite good dietary and oral hygiene status.
- Pain/Sensitivity – localised to the affected molars.

Initial Treatment

- **GC Tri plaque iD Gel** to measure effectiveness of home care program.
- Stabilise and protect affected tooth surfaces using GC Fuji VII or Fuji VII EP.
- GC Tooth Mousse applied every evening or twice a day (in severe cases) after tooth brushing.
- Adult strength fluoride toothpaste twice a day.

Follow-up Treatment

- **GC Tri Plaque ID Gel** to measure effectiveness of home care program.
- Definitive restorations where required: GIC as a dentine replacement and bonded composite to replace enamel in mildly affected teeth and preformed (stainless steel) crowns in severely affected teeth. Regular review as enamel bond strengths are reduced. Tooth extraction and specialist referrals for more severe cases.
Surface protection and stabilisation

An erupting Hypomin first permanent molar showing occlusal breakdown. A brush cone is used to remove plaque.

Clean and condition using CAVITY CONDITIONER. After rinsing avoid over drying.

Apply FUJI VII EP over the occlusal surface.

Apply Cocoa Butter immediately following placement.

Completed surface protection.

Surface protection using Fuji VII on a Hypomin Molar: 11 year recall.

The objective of surface protection with GIC is two-fold. Firstly to create a hardened outer layer which prevents plaque accumulation and provides an elevated level of fluoride protection. Then additional internal protection is achieved through creation of a stronger and more acid resistant zone formed by the chemically fused seal between GIC and Hypomin enamel.

Over time, calcium and phosphate ions from saliva penetrate into the set GIC matrix and this uptake further hardens the cement structure.
Baroni and Marchionni (2011) monitored the effects of supplementation with GC Tooth Mousse on Hypomin molars (30 children aged 6-9 years) over a period of 3 years.

At three years’ follow-up, enamel "mineralisation, morphology, and porosity appeared markedly improved, with calcium and phosphate levels reaching almost normal levels."

In brief, Baroni and Marchionni concluded that "calcium-phosphate casein improved enamel morphology in vivo. Given the absolute lack of in vivo studies and supplementation trials, our protocols with CPP-ACP may help functional restorative techniques in treated MIH molars and aesthetics in untreated incisors".

CPP-ACPF reduces porosity and improves homogeneity of Hypomin enamel (in vitro)  Dr Felicity Crombie, Melbourne Dental School

CPP-ACPF (casein phosphopeptide amorphous calcium phosphate fluoride) application provides ions for further mineralisation, reducing porosity and improving homogeneity of the enamel.
The D3 Group is an independent group of practitioners, scientists, public health professionals, industry and members of the public who aim to encourage improved research and healthcare of Developmental Dental Defects (DDD=D3). GC is a supportive family member of The D3 Group family.

The D3 Group’s mission is to develop and exploit a translational research network in Australasia and beyond by strengthening global efforts toward D3 to foster research and training. The D3 Group’s ultimate goal is to improve the health and wellbeing of people afflicted with D3.

The D3 Group website has important information to help educate people about D3 as it pertains to them – families and patients, the public health sector and politicians, practitioners and industry, researchers, educators and students.

The D3 Group aims to work with industry to foster effective education, research and advocacy.

A storybook, “It’s just one of those things Sam. A Kids’ Guide to Molar Hypomin”, is also available on The D3 Group website for online reading and/or download. www.thed3group.org/sam-has-molar-hypomin.html
Molar Hypomin Management

Diagnosis

GC Tri Plaque ID Gel™
40g tube (36ml)

Stabilisation & Protection

GC Fuji VII CAPSULE
Box 50 capsules
Shades: Pink or white

GC Fuji VII EP CAPSULE
Box 50 capsules
Shades: Pink or white

GC Capsule Elongation Tip
50 pieces
Suitable for use with Fuji VII EP only

Home Care

GC Tooth Mousse Plus
Topical crème with calcium, phosphate and fluoride
Assorted pack 10pcs contains:
4 x Mint, 4 x Strawberry, 2 x Vanilla
40g tube (35ml)
Also available in a mint only 10 pack.
New Zealand stocks only GC Tooth Mousse Plus Mint 10 pack.

GC Tooth Mousse
Assorted pack 10pcs, 2 of each flavour
(Melon, Strawberry, Tutti-Frutti, Mint & Vanilla)
Strawberry, Pack of 10 pcs
Vanilla, Pack of 10 pcs
Mint, Pack of 10 pcs
40g tube (35ml)

Mahoney EK, Morrison DG. Further examination of the prevalence of MIH in the Wellington region. NZ Dent J. 2011; 107(3):79-84

GC Australasia Dental Pty Ltd
1753 Botany Road, Banksmeadow,
NSW 2019, Australia
T: +61 2 9316 4499
F: +61 2 9316 4196
www.gcasia.info

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