Shared Wisdom
on
combs and combing
for effective detection and eradication of head lice and nits

2016 Edition

"The success of fine toothed combing depends on the choice of comb"
Hill et al, British Medical Journal, 2005

Most families re-used their original Bug Buster Kit to detect and cure any new infestation for at least a year.
Hill et al, 2006

COMMUNITY HYGIENE CONCERN

Live egg with a young louse on the head

Head Lice...

Healthy lice live in the hair close to the scalp, their feeding ground. Their sole food is blood which they draw when they bite. They are beige-coloured but darken when they feed. Well-hidden on a head, they are difficult to see, particularly in brown hair.

Transmission

Head lice climb swiftly through dry hair. During *close* head to head contact, full-grown lice take the opportunity to make a quick transfer. Younger lice tend to remain on the head where they hatch until completing their last moult (6 days or more).

Head lice moult their skins to grow through 3 nymphal stages. Full-grown lice are 3mm long. Here you can see them life size and to scale with a matchstick and pin.

actual size ▲

magnified ▶

Eggs

An unhatched egg is about 1 mm long by 0.3 mm wide

Eggs are tear-shaped and pin-head size. They are laid singly, firmly cemented to individual hair shafts where the warmth of the scalp will incubate them. Often they are located close to the hair roots. A head louse usually hatches 7 to 10 days after the egg is laid (sometimes 5 to 11 days).

Live eggs are hard to find on the head because they reflect the colour of the hair. Most nit combs have rounded teeth. These cannot get a grip on live eggs stuck at the hair roots.

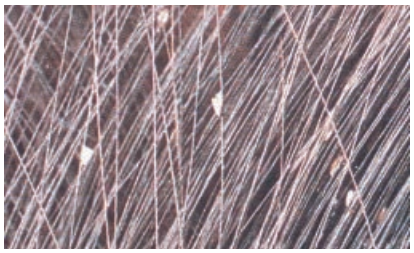
Nits

A true nit As the empty eggshell fills with air, it turns whiter and glistens. Firmly cemented to the hair shaft, it becomes more noticeable as it is carried away from the scalp by the growth of the hair.

Nits are the empty eggshells which remain on the hair shafts after the lice have hatched.

Although infestation with lice is commonly known as 'nits', strictly speaking, only the empty eggshell is a nit.

Are these nits in the hair?



A nit can only be *pulled down* a hair towards the tip.
A hair muff can be pushed *easily up* and *down* a hair.

Not a nit! ....a hair muff! Something that looks like a louse egg stuck on a hair is confusing: it could be a live egg, a dead egg, an empty eggshell (nit) or a scalp secretion wrapped round the hair. This picture shows a harmless scalp secretion, a hair muff.

Nits – empty eggshells – can be unsightly...
...but are harmless

Unfortunately, hairdressers commonly turn away clients with nits, and children with noticeable nits are sometimes excluded from school, or bullied. In these cases, it is important to remove the nits, but only *after the head is freed of live lice*.

First *find* and *clear all the lice*, then remove obvious nits.

Detection

accurate louse detection is crucial to effective control of head lice

Families need the right comb, and the knowledge of how to use it, to detect a low level of lice. This empowers them to diagnose lice early and to check the efficacy of any medication they use.

A co-ordinated approach works best. The detection and treatment of hidden cases at the same time as obvious cases, stops head lice from endlessly circulating. On Bug Busting Day, screening by informed parents at home ensures both family and school contacts are checked simultaneously.

Head lice are difficult to see on the head. Often there is no itching.

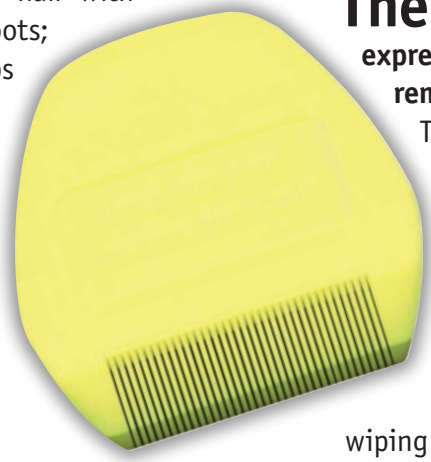
Inspecting or combing dry hair is deceptive because lice move rapidly away from disturbance, escaping detection. Just looking through parted hair misses most lice and even fine-combing dry hair can miss the many light, but contagious, cases. **Bug Busting® wet combing** is 25% more accurate than fine-combing dry hair. Even when there is only one louse, you can find it the Bug Busting way.

Really wet lice stay still. Washing the hair with ordinary shampoo takes moisture to the roots; applying lots of ordinary conditioner helps to straighten and untangle the hair with a wide-tooth comb, and keeps any lice immobile. Using a good quality plastic comb saves time and trouble.

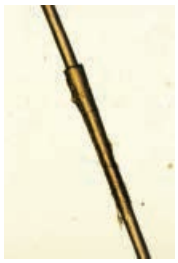
National Bug Busting Days
Informed co-ordinated community action removes the stigma and reduces the cost of treatment.
The bug stops here!

The Bug Buster® comb

expressly designed for *louse* detection and removal



The points of the square-edged teeth are deeply bevelled, ideal for sliding underneath lice at the hair roots. The space between the teeth is the optimum width to trap newly hatched lice whilst still allowing comfortable passage through the hair. Lice can be clearly seen and removed with ease by wiping the comb on kitchen paper or rinsing.



Cement left on the hair shaft when the nit is broken off.

Nit combs

Nit combs are unsuitable for *louse* detection and removal

To pull off nits efficiently, the teeth must be less than the width of a nit apart. It is difficult to clean between these tightly spaced teeth. For nit removal, this is not important, but if live lice are caught there and remain unnoticed, at subsequent strokes they can be combed back onto the hair undamaged.

Additionally, rounded teeth on both plastic and metal combs slip over lice, leaving them undetected.

Use a purpose-designed louse comb thoroughly first, then finish with a nit comb.

Eradication

Bug Busting provides child-friendly eradication without medication

Bug Busting wet combing removes lice systematically, breaking the life-cycle in 4 sessions spaced over two weeks. Tedious egg removal is not necessary. Lice hatching after the first session are combed off before they are mature enough to spread or reproduce. **If the precise instructions in the Bug Buster Kit are followed**, a child is not contagious between sessions, and the carer learns to recognise any new incoming lice.

Shampoo and conditioner suited to the patient's scalp and hair type are used.

Removing large numbers of lice does not involve much more effort than the detection of a few. The Bug Buster combs simply take off a larger number of lice at each stroke.

'Wet combing' variations do not work as well as Bug Busting wet combing:
Conditioner on dry hair The advantage of taking the moisture to the roots of the hair, where most lice are found, is lost if conditioner is applied directly without really wetting the hair first. The conditioner tends to sit on top, fine-combing is stickier, and plastic combs bend and break.

Oily products instead of conditioner This substitute is both inefficient and messy. Oil is liable to drip and stain, and requires extra shampooing to remove afterwards.

Rinsing lice from a **Bug Buster** comb


Nit Buster comb in action – the whole nit with the cement sheath slides off comfortably, after the conditioner used for Bug Busting has made the hair silky. The Nit Buster comb is included in the Bug Buster Kit.

Safe – effective – affordable, approved for NHS prescription from your GP or health visitor and some pharmacists, so it is free for children (Drug Tariff, Part IXA, Appliances, HEAD LICE DEVICE since 2002).
Pharmacies can obtain supplies from AAH, Alcura (Alliance Healthcare), Pharmacy Link, Phoenix Healthcare, Quantums and Sangers. Pip-code 233-1783.

All the combs you need for detection and cure are in the **Bug Buster Kit:** 2 x mini Bug Buster combs, a maxi Bug Buster comb, the Nit Buster, a wide-tooth comb, with full colour step-by-step instructions and an explanatory booklet.

One re-usable Bug Buster Kit per family is sufficient

Available to purchase online at www.chc.org

Supporting evidence – see back page

www.chc.org • One-to-one Help Line: 01908 561928
bugbusters2k@yahoo.co.uk

Produced by the charity, Community Hygiene Concern, the Bug Buster Kit is a non-profit supply.

A successful strategy for the management of pediculosis capitis

"Public education is, indeed, a most effective insecticide"[1]

Dr RJ 'Paddy' Donaldson (1920-2005) pioneered a successful strategy for head louse control in the 1970s. He showed that the linchpin is co-ordinated diagnosis of all cases in a community. United action by engaging parents in an intensive detection/treatment campaign halved the infestation rate, even though failing treatments were in use. Parents learnt to check thoroughly to find lice, ***and to check again after treatment***, whatever the label promises[1-4].

Community Hygiene Concern (CHC) is a not-for-profit organisation set up in 1988 to help schools, community health services and parents cope successfully with head lice. Paddy Donaldson was our tireless mentor. He took a personal interest in our development of wet methods of detection in preference to less effective dry or damp methods. Using action research techniques, we assess methods of detection and cure, working with families and schools. We disseminate information on best practice when we find evidence of effectiveness[3-9]. At the 2002 International Congress on Lice, we presented a summary of the standards set during the development of our combs[7]:

1998 Bug Buster combs for comfortable, speedy, and accurate louse detection

- A louse comb is best made entirely in good quality plastic (better than metal pins pegged in a handle)
- The tooth shanks should be square-edged, deeply bevelled at the front of the points, and flat at the back (better than rounded) - the bevel side is held against the scalp, achieving the best angle for trapping lice as the comb is drawn through the hair
- A tooth span of 4 cm is suitable for the contours of a young child's head; just over 6 cm is the maximum practical span on an adult head
- The gaps between the teeth must be just narrow enough to trap the smallest lice, but still allow the easiest passage possible through the hair - it follows that a good louse comb is not going to exert the traction needed for nit removal.

CHC advises that fine-combs should be divided into louse or nit comb categories according to the tooth spacing:

Ready reckoner: Nit comb or louse detection comb?

Width of gap between teeth	Nit comb	Louse comb	Recommendation:
0.09 – 0.19 mm	Yes	Too fine	Dedicated single-purpose combs are required, and thorough louse detection should be performed with a louse comb before nit removal is considered.
0.20 – 0.30 mm	Too wide	**Yes**	
0.31 – 0.50 mm	Too wide	Inefficient	
Using a nit comb to detect and remove live lice is inadvisable because lice trapped between the teeth can remain unseen and be combed back onto the head unharmed.			

We welcome independent evaluation of our findings[10-18].

CHC organises educational Bug Busting Days which run three times every year on 31 January, 15 June and 31 October.

Removing the stigma of lice On Bug Busting Days, parents are asked by their child's school to use their Bug Buster combs, following the instructions provided, at home. The aim is to find any lice in their own families, then proceed to treatment, if necessary, and finally to verification that their choice of treatment works – no more, no less. Parents are not required to personally notify anyone if lice are found because co-ordination of effort removes the need for this stigmatising task.

Reducing the cost of lice A 24% decrease in primary care trust spending on prescribed treatments, and appreciable savings in professional time were reported when the Bug Buster Kit was the first-line treatment, combined with participation by local primary schools on national Bug Busting Days. GPs and Nurse Prescribers offered either a Bug Buster Kit or double dosing with insecticide plus Bug Busting monitoring. Families found it easier to stick to Bug Busting rather than mix two different procedures[3,4].

By encouraging schools to participate in our schools' programme, the Health and Education services are helping to ensure that parents have access to authentic Bug Busting information[19,20].

Standards in the regulation of products to remedy head lice

In the UK, remedies for head lice are regulated by the Medicines and Healthcare products Regulatory Agency (MHRA). They are classified either as medicinal products or as medical devices[21]. Inexplicably in our view, even bottled and spray mixtures may fall into the low safety risk category of Class 1 medical devices, on a par with non-medicated bandages. Classification of formulated products depends upon their mode of action, those deemed to kill lice by physical means, *eg* suffocation, rather than by chemical disruption *eg* neuro-toxicity, often being classified as 'fluid' medical devices[22].

At the present time, most products claim a physical action on lice. As Class 1 medical devices, they must be marked 'CE', and may be sold in general stores as well as pharmacies. To obtain a marketing authorisation, the manufacturers of a CE product *self-certify that the device meets the relevant regulatory requirements of working properly* when used as intended, and being acceptably safe. Product claims made by the manufacturers are not verified by an independent assessor[23].

Combescot-Lang *et al* (2015) tested the effectiveness of 21 x CE products, by using them according to the packet instructions on head lice and their eggs collected from the heads of children and swiftly brought to the laboratory. Head lice removed from their natural habitat are rapidly weakened by dehydration. Nonetheless, only 6 products were found to be potentially 100% effective and the study authors conclude that the market is "swamped with poorly tested and ineffective products" and call for "rigorous efficacy testing preregistration and periodic screening and testing of effectiveness in the post-registration period". They also complain of insufficient composition disclosure which hinders a patient from making a comprehensive allergy check[24]. This study was made in France, however, some products tested have a global market, and regarding others, very similar formulations are to be found all over Europe and beyond. CHC joins with the authors in their call for more stringent regulation because in our experience people naturally assume that in civilised countries products are checked for efficacy and safety before release onto the market. Families are deeply disturbed when they learn that this is not so for products used to medicate children, and want better consumer protection. CHC considers that all formulated remedies for lice should be subject to medicinal product regulation and be dispensed on the advice of a qualified health care provider.

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Picture of a young louse with an egg is reproduced with the kind permission of the Electron Microscopy and Histopathology Unit at the London School of Hygiene and Tropical Medicine and of a hair muff courtesy of Durwen Audio Visual; other photography by José Figueroa and Chris Fry

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