



UN SDG – 11

REDUCING CARBON EMISSIONS BY BIO-INSPIRED DESIGN

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the problem

Sustainability is affected by a major cause – urban waste. Specifically **medical waste** as the carbon emissions realised from it are immense.

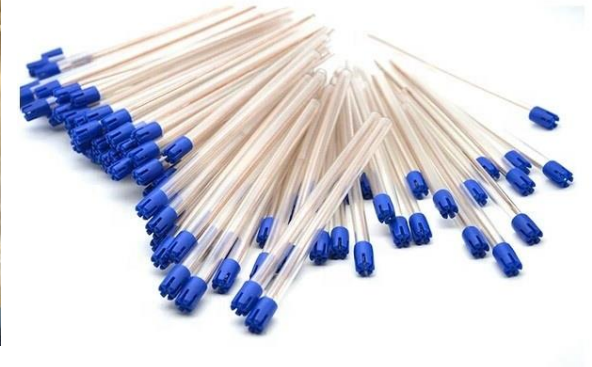
90% of the medical waste produced is through **one time use products**. One such product is the dental saliva ejector. Dentist have to throw these after one use as a part of infection control protocol.

Plastics are used (for flexibility) and cannot be sterilized and reused.

There is a high chance of the patient biting it as it is placed inside the mouth throughout.

The tube has to be bent before use, and many times ruptures/gets pressed.

They have to be bought in bundles and costs 5-6\$ each, which adds up to a huge amount and a lot of waste over time.





The existing solution to this is the metal ejectors, causing issues with flexibility/bending and usability overall.

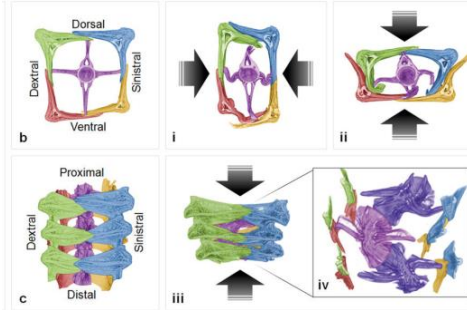
An animal need to chosen which can help with the structure of the ejector. Something where metal can be used to replace plastic use and can be reused after sterilization. It need to solve the flexibility issue, grip issue and enhance overall usability.

Animal tail structures, which are strong yet flexible, bendable and stress absorbing are the focus.

starting point



Some of the possible inspirations with the required trait, which can be considered.



structure

The tail of a seahorse is built of a square structure. It is highly compressible in both its cross sections, completely ruling out breakage.

The 4 corners of the square are interlocked with each other and have a stretchy material in the centre. For our case – springs can be used with metal on the outside.

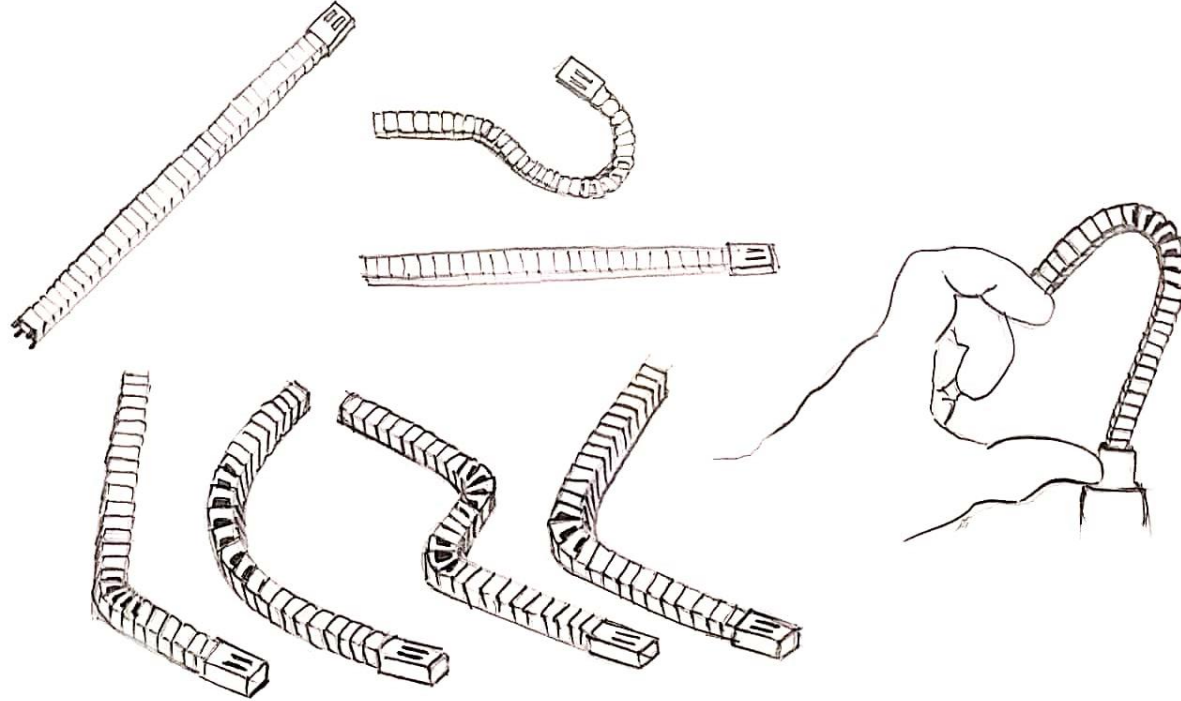
bio inspiration

Seahorse tails have a unique structure which make it the perfect fit for saliva ejectors form.

The structure of a seahorses tail is square rather than a circle. It gives more grip. It can bend more than the usual circular tubes without breakage/bending/pressing. The structure also provides a better grip than round surfaces. It is more durable.

The seahorses tail shows varied structures and bending postures. Taking that as the basis of the form, a basic wireframe is formed which is bendable and strain absorbing. It is possible to bend and press the form in multiple ways, which solves our problem. We can now use a reusable material(metal) and make saliva ejectors which can be easily sterilized.

Research Intervention Concept Visualization



The final product is the saliva ejector inspired by a seahorse, following bio inspired design. The ejector is reusable and does not compromise on the flexibility factor seen in the original product. There will be no more one time use ejectors, reducing medical waste, saving money and reducing carbon footprints in urban societies.

This is one step toward creating sustainable cities and communities by reducing waste in the medical field.

thank you