

## Short Communication

# ‘Life-Changing Bubbles’ – How carbonated water can relieve swallowing problems for many dysphagia sufferers worldwide

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## Abstract

Today, there are said to be some 590 million people of all ages around the world, who are suffering from a range of swallowing problems – probably about 4 million in the UK. Either living at home or as residents in some 20,000 Care Homes, with perhaps another 25,000 as patients in hospitals every day.

Professor David Smithard, of the Lewisham and Greenwich NHS Trust, has been leading a national campaign for some years to raise general awareness of Dysphagia and to improve the treatment of patients with varying conditions.

He and his team at the Queen Elizabeth Hospital have now completed a detailed Review of the use of carbonated water (CW) in the treatment of Dysphagia, which has just been published and can be accessed here: <https://www.mdpi.com/2308-3417/8/1/6>

The Review concludes that further evidence-based research is essential before CW can be adopted as standard in clinical practice – but that although the amount of evidence is small, there is a suggestion that swallows are safer and that secretion management improves, and consequently until further studies are undertaken, Carbonated Water should be limited to individual patient use.

My experience as a Dysphagia sufferer is that the use of CW has resulted in life-changing benefits, and this paper is devoted to describing how CW worked for me, and what the practical requirements are, so that many others may be able to benefit as I have done.

The paper has three sections: My Personal Experience, Practical Considerations, and Conclusions.

## My personal experience

### Background

I am an 89-year-old retired businessman. I developed dysphagia as a result of throat cancer and osteoradionecrosis (non-Hodgkin’s lymphoma treated with radiotherapy) some 60 years ago, resulting in the eventual loss of my teeth, hearing, and balance. My dysphagia has had a major, often daily and sometimes embarrassing, impact on my eating and consequently my social activities over the years, involving:

- Regular choking fits, which normally required a visit to the bathroom, lasting perhaps five minutes or more.
- On many occasions, some food or drink is discharged through the nose.
- For many months, coughing, choking, or sneezing

caused minor nosebleeds, mainly from the right nostril only, or sometimes a full-scale bleed.

- A full set of dentures became with age an increasing hazard, with a tendency for some foods to cling tightly to the upper palate and with the lower set being dislodged. Ever since, I have had a real fear of swallowing the lower denture completely, during a major coughing or choking episode.
- Social activity was obviously hazardous, and matters came to a head in 2012 during a smart Club Dinner with some 40 other guests, when I choked and deposited a mouthful of food and drink and a lot of blood over one of the tables and two unfortunate diners!

Apart from such dramatic occasions, the whole process of eating had become a tiresome and boring activity, and as

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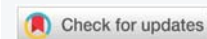
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a result, I lost about 6.5 kg in weight. It put an end to almost all social activity – avoiding all events, business meetings, or social gatherings that might involve refreshments of any kind.

At the age of 86, after about twenty years of constantly clearing my throat, coughing, and choking throughout all meals and snacks, my granddaughter suggested I should try drinking some of her sparkling water to ease the problem. It turned out to be a life-changing moment!

I obtained a small domestic carbonating device, and the results were extraordinary. About five months later, after many hours of experimentation, success, and failure, I was enjoying eating once again, I had regained the lost kilograms in weight and my long-suffering family was much relieved!

As a bonus, my frequent bouts of indigestion and constipation had almost entirely disappeared.

For me, the case for carbonated water (CW) as a treatment for the eating problems of dysphagia was by then already proven! – Although I realized that further research and experimentation were obviously essential.

## Results

I have been using carbonated water (CW) every day for the last two years, as part of my diet throughout the day, to ensure that eating remains an effective and pleasurable exercise, and to continue the examination of swallowing problems and solutions related to dysphagia.

I have only used CW made by me from tap water with no additives, for there is no question that, for me, other sparkling drinks such as Colas, etc. are not suitable – they are more difficult when taken as a drink, and are not as effective in helping the swallowing process.

I have been happily eating many different foods and dishes over this time: stews, casseroles, soups, cold meats, quiches, porridge, fruit, yogurts, some biscuits, and some chocolate – and during this period of experimentation, the number of coughing and choking incidents progressively reduced substantially.

I am delighted to report that although I still have occasional short coughs, I have had no choking events for the last eleven months!

### The key findings

A. The primary and most crucial reason for using CW is not, as many initially assume, to wash a bolus down the throat, but for me, it is to remove the saliva and any remaining debris from the mouth, cavity, and throat – in order to clear the mouth and throat for the arrival of the next mouthful of food. CW taken in small quantities can of course help to remove a bolus, but taking too much CW with a mouthful of food will inevitably cause severe choking.

### B. 'Clagginess', 'Crunchability', and 'Chewability'

The texture of the food to be swallowed is of course crucial, and whilst its softness and viscosity are fundamental, I have found that it is also essential to consider the qualities in other practical terms.

The 'clagginess' ('stickiness' or 'tackiness') of the food in the mouth, or a bolus in the oral cavity, is the single most important quality, which varies within broad types of products and between different brands. For example, porridge made with large flakes is less 'claggy' than porridge made with normal or standard-sized flakes, and the 'clagginess' can even vary between two different brands of larger flakes.

The 'clagginess' of food can of course be changed when in the mouth, by sipping CW or by adding CW or some other liquids to the food (e.g., pureed fruit with porridge) – but it can also be reduced by adding other suitably 'crunchable' foods, such as certain types and brands of crisps and biscuits, in the right quantity.

Some selected food items, when crunched by the teeth, break down into consistently uniform small pieces, making them easier to swallow immediately in that form or to mix conveniently with any 'claggy' foods in the mouth.

For example, soft cheeses, etc. can be made less 'claggy' by putting a 'crunchable' crisp into the mouth actually with the cheese, or immediately after it. So far, I have found two brands of crisp with the right texture, where the potato is cut in a 'furrows' or 'ridge-cut' form, which makes them more easily crunchable than most other crisps.

When the taste of food is especially important, such as with my favorite Lemon Sole, I chew that alone for some seconds, and then add the crisp to be crunched with it just before swallowing!

'Chewability' of course depends on the effectiveness of your teeth, natural or dentures, but I have avoided most of the 'High Risk' foods, as listed on many Websites – especially vegetable and fruit skins, tough meats, all nuts, and dried fruits – as well as many cereals, mueslis, biscuits and crusty bread. After many months of experimentation, I have categorized all foods as 'favorites', 'possibles', and 'untouchables' – and I have kept all mouthfuls small, with pieces of food (chicken, fish, fruit, etc.) being no bigger than about 10mm square or diameter.

A. I have found that eating without coughing or choking requires careful planning and continuous concentration. Apart from the careful choice of menu and foods as mentioned above, I have tried to follow some basic rules, along the following lines:

- o *Ideally, meals should be taken alone, or with relations or friends who understand the situation, so that free-flowing conversation can be avoided.*



- o *Meals should be timed to avoid losing concentration – caused by sudden interruptions from children or pets, or by any other distractions, even from unexpectedly dramatic and noisy television programs. Phones and doorbells should be left to ring unanswered.*
- o *Any sudden movement of the head, blowing the nose, or standing up, should be avoided at all times while food or drink is in the mouth, waiting to be swallowed.*
- o *The position of the head during the eating process may be effective in completing a swallow. (I have found that to drop my chin by 20 or 30mm, with a small twist of the head to the right at the crucial moment of swallow, can be very beneficial).*
- o *A swallow of CW is the perfect preparation for the taking of medicines and especially for swallowing small pills, such as the 75mg aspirin.*
- o *I have avoided drinking CW within half an hour of going to bed, for I have found that it can encourage reflux activity later on.*

D. In practical terms, it was essential for me to always have access to a supply of CW in small 150ml to 300ml glass bottles, with tight screw tops, ideally chilled from the fridge, for use wherever I am during the day. At the moment, I manually decant my CW from a small domestic device, but I can confirm that equipment now exists to produce CW at home via tap supplies, and when needed in the future, appropriate systems will be available to provide larger volumes of bottles each day for residents in Care Homes or for patients in the hospital.

## Summary

The use of carbonated water as described above has been a wonderful and life-changing experience for me, and I am convinced that it can be for many others too, (depending on their individual medical condition and circumstances), if they are prepared to devote many hours, initially and perhaps over some months, to personally experimenting with different foods that they like, to trying different techniques in food preparation, and to concentrate continuously on a process of eating and drinking that suits their personal needs and circumstances.

### Practical considerations

#### 1. CW Product Specification and Safety

The 'fizzy drinks' market in the UK is huge and confused, with products variously described as 'carbonated', 'sparkling', 'soda', 'club soda', 'seltzer', etc. – and I believe it is important for the drinks industry, the medical world, the media, and the public at large to understand that the product referred to throughout my document as 'Carbonated Water' (CW)

is not related to any of these names or brands but is clearly defined as being 'standard approved tap water, carbonated with CO<sub>2</sub>, without sugar or any other additives – as normally now produced through domestic or commercial devices at the point of use.

For convenience and clarity, throughout the beverage industry, the technical and medical worlds, all Authorities and Regulators (e.g., the FSA, etc) and the public generally, this quality of carbonated water could perhaps be referred to as 'Standard Tap, Additive Free' – or perhaps 'STAF' for short.

With this specification, there would be no need for special 'medical' products or other competitive brands, because the cheapest possible product could be available to every individual worldwide.

Ideally, the FSA and other authorities would issue statements to confirm the safety of the 'STAF' product, confirming that it was:

- No danger to tooth enamel, bone condition, or general health, even in regular use.
- An aid to the maintenance of oral hygiene.
- A positive help for many in the prevention and treatment of indigestion and constipation. The clarity confirmed by such a statement would be warmly welcomed throughout the medical world and by all participants in related sectors, such as Nutrition, Health & Fitness, and Sport, etc. – as well as the commercial sector.

#### 2. Dysphagia sufferers in the UK – and their Needs

Dysphagia patients in the UK are to be found in three broad sectors:

##### a) Individuals – living in the community

Estimates of Dysphagia sufferers of all ages in the UK, that live at home, alone, with family or carers, vary between 2.6 and 3.9 million. Many will be elderly, with frailties, other medical problems, disabilities, or disadvantages – but all will require easy access to suitably designed small bottles of CW.

##### b) The elderly or infirm – in care homes

In the UK, there are currently some 430,000 elderly people living in 21,492 care homes, nursing homes, and hospices – an average of 20 residents per home. Most residents are over 65 years old, with between 40% to 60% suffering from dysphagia, and many requiring nutritional support.

##### c) Hospital patients

On any one day in the UK, there will be around 160,000 in-patients in about 1,680 hospitals – and in 2017 about 22% were over 75 years old. The numbers with Dysphagia will vary according to the range of other illnesses and general health,



but in a large hospital, the total number of bottles of CW required every day might be 600 or more.

### 3. Bottles for CW

Small bottles of CW are of course a vital requirement, and it is assumed that the bottles specially designed for CW use would:

- Hold between 150 ml to 400 ml – according to individual needs or for different meals.
- Be made of reusable glass, suitable for machine washing to NHS standards.
- Have safe-sealing screw caps.
- Be stable during rapid movement on trays and trolleys.
- Have caps, suitable for the grip and handling by those who are frail and have poor sight, shaking hands, or arthritic fingers.
- Have suitable surface space for labeling or the writing of names, dates, additives, and special notes, as required.

Pure CW, as specified above, is not available commercially in small bottles anywhere, because it is clearly not economic, and there is therefore no possibility of CW being offered commercially in the future in the specially designed bottles described above.

However, it is assumed that most individual domestic users would be happy to manually fill their own bottles, using CW decanted from larger bottles, filled from their domestic production devices, or from piped supply if available.

It should be remembered that many of the general public, at work or play, will want to carry some CW with them, ready for lunch 'on the move' or to clear their throat at any time – so that suitable plastic containers or hip-flasks will be needed.

### 4. Equipment for bulk supply

If and when the use of CW for Dysphagia sufferers becomes

significant, the managers of Care Homes and Hospitals will need suitable equipment on their premises to provide substantial numbers of small bottles of CW on a regular basis.

Such equipment is of course already available for the piped production of CW, with reverse osmosis purification, rapid bottle-filling, and the bulk-handling and washing of bottles in suitable racks, etc., as required to suit differing locations, volumes, and economic factors.

However, the commercial catering sector will need to prepare for the possible demand, and provide a range of alternative 'installation packages that will be appropriate, both for differing, small, and often hard-pressed Care Homes and for the wide range of NHS hospitals and other institutions.

## Conclusion

I believe this paper should be published and broadcast as widely and as soon as possible around the world so that all the millions with Dysphagia will have the opportunity to try and experiment with the process that has been so successful for me. I cannot believe that it will suit everybody, but they must surely have the chance to try.

If the research planned by Professor Smithard is in due course positive and supports the personal success that I have described, then we will certainly have a most exciting story to tell the millions of Dysphagia sufferers around the world.

A successful outcome would then require a huge program of communication, coordination, and training with many organizations, institutions, and commercial interests internationally.

What a marvelous legacy that would be for the large numbers of people who have worked so hard to find an effective solution in the last 30 years or more, in many organizations and in different countries – and especially for Professor Smithard and his team at the Queen Elizabeth Hospital in the Lewisham and Greenwich NHS Trust, who have fought so successfully to awaken the 'Sleeping Giant of Dysphagia' in this country.