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## Use of sodium carbonate as bone preparation agent

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### Abstract

The need of the prepared bones will never be ending and a process which can be quick, without involving manpower and producing long lasting bones is being described in this technique, which we feel has evolved out of serendipity.

**Keywords:** Bones, sodium carbonate

### Introduction

The utility of dry human bone is for medical students, anthropologists, archeologists, curators, implant manufacturers and forensic experts. With restriction of access to unlawful ways of having bones from the dead bodies, the availability of the bones to medical students has decreased and many institutions have shifted to artificial bone models. The natural bones if can be preserved for longer time can help in building up the bigger pool of dry bones for educational activities.

The various methods used for getting the bones are maceration, enzymatic maceration, detergent maceration, insect maceration and use of chemicals <sup>[1, 2, 3]</sup>. Each process has advantages as well disadvantages.

We at our centre has used Sodium Carbonate (washing soda) as macerating agent after manually removing the soft tissues for preparing the bones, a process which is largely not favored because of it not giving longevity to the bones.

### Material Used

1. We have used the pelvis of embalmed bodies for preparing the pelvic bones, which were available after dissection in the anatomy hall of department of anatomy.
2. Sodium carbonate (washing soda)
3. Hydrogen peroxide
4. 15 litre vessel.
5. Gas stove.

### Description of technique

All soft tissue except for ligaments of pelvis was manually removed. The water in container was warmed, and in 15 liters of water, 250gm of sodium carbonate was dissolved. The pelvis, denuded of soft tissues was put in the container and the solution was made to boil for 30 minutes. The pelvis was transferred immediately under running tap water for sudden cooling.

The recovered bones were immersed overnight in a diluted hydrogen peroxide solution. The bones were taken out next day and washed with running tap water and dried in room air. They were quiet clean didn't required brushing. No wood polish was applied on the bones.

### Results and Discussion

We had prepared 12 pelvis in year 2013. It yielded 12 sacrums and 24 hip bones.

All the sacrums and hip bone are being used for teaching purposes since 2013. The last inspection of the bones were done in 2017.

All the bones were well in shape and architecture on the last inspection.

The need of bone preparation will always stay with any amount of modernization and technology advancement, because the best 3 D understanding of the attachment of the

structures is possible when we have the required bone in our hands in anatomical position. The various techniques described are maceration by burying, using insects, chemicals, enzymatic maceration and detergents [3, 4, 5]. Though the washing soda is a chemical as well as a washing agent but is not classified as a detergent. The chemicals used for chemical maceration are ethylenediaminetetraacetic acid, sodium hydroxide, Xyol, borax, hydrogen peroxide and baking soda [6].

The quality of bone depend upon the exposure to various chemicals during the preparation and excessive exposure to hydrogen peroxide, sodium hydroxide or to detergents can cause brittle bones, but the bones prepared by this process has so far not broken or has suffered any attrition. This we can attribute to the sudden cooling of the boiling bone.

This process has a drawback of producing foul smell while boiling which is overshadowed by it being cheap, time saving, needing minimum manpower and resources.

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**Fig 1:** During the process of technique



**Fig 1:** After completion of technique

### Conclusion

This Technique of bone preparation has good quality bones, which stayed maintained in last four years has probably has evolved out of serendipity and is being further evaluated for a longer time result and standardization of the time needed for different steps.

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