# INFLUENCE OF THE WOUND DRESSING COMPOSITION ON THE PH AT THE INTERFACE WOUND DRESSING-EXUDATES

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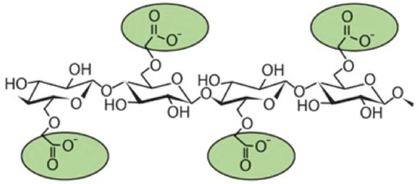
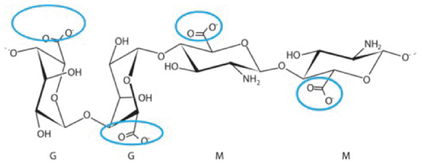
## INTRODUCTION

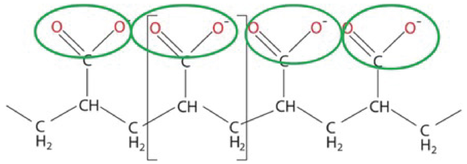
Dressings used for the desloughing of chronic wounds are based on non-woven fabrics made of fibers of different chemical nature, such as carboxymethylcellulose, alginate and ammonium polyacrylate.



**Carboxymethyl cellulose**




**Alginate**



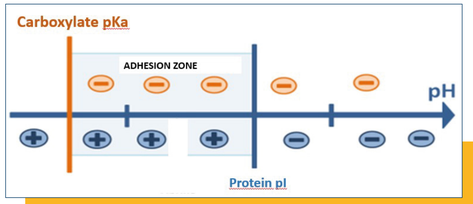
**Ammonium polyacrylate**

Much of those materials are bearing groups that can dissociate upon contact with aqueous liquid such as wound exudates, revealing anionic charges, most often carboxylates –COO-

Upon contact with the wound, electrostatic interactions can develop between exudate components and fibers. These interactions develop primarily between the anionic charges of the fibers (most often carboxylates) and the cationic charges of wound exudate proteins, such as fibrin.

The protein's overall charge depends on the environmental pH and is determined via its isoelectric point (pI), which is comparable to the nil charge point:

- **Cationic (positive charge) below pI**
- **Anionic (negative charge) above pI**




Protein cationic charges will be in greater quantity at low pH.

However, since the pH of chronic wounds is high, generally between 7 and 9, it will be beneficial to locally reduce the pH of the exudate in contact with the non-woven fabric to ensure that more cationic charges are present to interact with the anionic charges of the non-woven fabric.

In this study, we investigate how the composition of different dressings influences the pH of exudates as soon as they come into direct contact with the dressing.

## METHOD

To simulate chronic wound exudate, we use buffer solutions pH 7 and pH 9.
We soak the dressings into the buffer solutions for 30 seconds to one minute, drain them and then measure the dressing surface pH with a Cutometer through a surface pH probe.
Each measurement is taken over 20 seconds time, and the result is the average pH value during this period.

## RESULT / DISCUSSION

The method has been applied to commercial wound dressings based on fibers of different nature: carboxymethylcellulose, alginate and ammonium polyacrylate.
It was shown that the nature of wound dressing fibers affects the pH values measured : After soaking into buffer solutions, we observe a shift of pH towards lower values, this effect is much more pronounced with ammonium carboxylate wound dressings than for alginate or CMC.

| Sample | Buffer pH7 | Buffer pH9 |
|---|---|---|
| Buffer solution | 6,98 | 8,87 |
| UrgoClean Mesh | 6,27 | 7,42 |
| UrgoClean Pad | 6,39 | 7,64 |
| UrgoStart Plus Pad | 6,19 | 7,51 |
| UrgoClean Ag Pad | 6,39 | 7,64 |
| Algosteril | 6,74 | 8,43 |
| Suprasorb | 6,62 | 8,31 |
| Aquacel Extra | 6,72 | 8,36 |
| Biatain Fiber | 6,97 | 8,61 |

## CONCLUSION

**This reliable and repeatable method enables to examine the relationship between the nature of wound dressing fibers and the pH at the interface of the dressing and the wound exudates. This improves our understanding of desloughing mechanisms in chronic wound management, ultimately leading to more effective clinical wound care.**

DIABETIC FOOT STUDY GROUP

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