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## Hydrogels Dressings - Its Production and Technology Innovation

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Janusz M. Rosiak in 1986 [1] invented the first hydrogel membrane for wound dressing processed by radiation in Poland and soon, after formal tests, arrived in the local market (1992) by the hands of its inventor). It was a technological breakthrough due to its product characteristics as pain reliever and enhanced healing properties besides its clever production process combining sterilization and crosslinking in a simultaneous operation. IAEA invited professor Rosiak and supported the transference of this technology for IPEN laboratories. The laboratories of developing countries, which face all kinds of restrictions, were seduced by the simplicity of the process and low cost of its raw materials. This was the seed of the flourishing activities in hydrogel dressings in Brazil and other developing countries.

Naturally, the development achievements are like a chain reaction; one start the other, so many other products based on hydrogels are being developed. The author's group [3,4,5,6] has been studying the radiation processing of hydrogels and its various applications in medicine. Some products are already in the market, but we are developing ours, like an intra-vaginal device, which releases prostaglandin to relax the muscles during the induction of labor. Others original products are being developed in our laboratories as, special dressings for wounds in the hands, special gels for bedsore and other pressure sore. There are important challenges such as to improves the mechanical strength of dressings without decreasing its softness, since, in general, the more resistant dressing will not touch the wound perfectly in some points, increasing pain.

Besides the technical approach one has to think in the commercial side if the product is realized to reach the market. These technical and commercial issues are commented below

Hydrogels dressings are new products; they are in fact a revolution in the traditional area of the wound care management. The important qualities are:

1. The most important feature is the pain relief, this effect is achieved by the gentle touch of the very soft membrane surface with the nerves terminations
2. The other key feature is the absorption of exudates; each kind of wound has a different rate of exudation, hydrogels dressings have different rate of absorption according to its polymeric structure, but as they are usually sold swelled by water, they are not useful for highly exudative wounds. Some dried dressing as can be used for highly exudative wounds.

Others important features are:

3. Barrier for bacteria; but provides access of oxygen to the wound;
4. It is soft and elastic, allowing an easy contour to the wound in difficult areas;
5. It shows adhesion to the skin without the tendency to stick, allowing a painless replacement of dressings;
6. its transparency allows the observation of the healing process;
7. it allows the application of drugs without dressing replacement;
8. its water evaporation decreases the temperature of the wound, helping to control the inflammatory process and decrease the pain also.

### REFERENCES

1. J.M.Rosiak,.; A.; Ruciska-Rybus, W. Pekala, U.S. Patent N° 4,871,490. Method of Manufacturing of the Hydrogel Dressings(1989).

**PRODUÇÃO TECNICO CIENTÍFICA  
DO IPEN  
DEVOLVER NO BALCÃO DE  
EMPRÉSTIMO**

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