



# Pharmaplast

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## **EXPERIENCE OF USING SILVER & IODINE CONTAINING WOUND DRESSINGS IN TREATMENT OF CHILDREN WITH LOCAL BURNS**

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### Purpose of work:

To assess following Pharmaplast Products on Children of the first 3 years of life, who were mostly injured with hot liquid as a thermal agent.



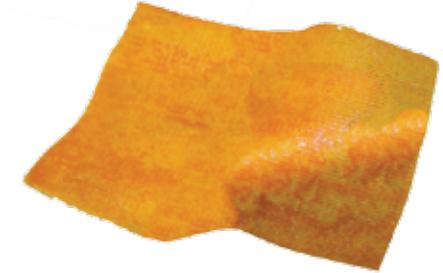
**Pharmacoll Ag  
(Fibrocold Ag)**



**Pharmagel Ag  
(Silkofix Gel Ag)**



**PharmaJelly Net Ag  
(Fibrotul Ag)**



**Vilowond POVI Gauze  
(Silkofix POVI)**

- During the period from **September 5 till December 15, 2012**, the Thermal Injury Clinic of the Federal State Budgetary Institution Moscow Research Institute of Paediatrics and Paediatric Surgery of the Ministry of Health of Russia used Pharmaplast S.A.E (Egypt) dressings to treat 40 children with thermal injuries. The observed patients were divided into 4 groups (of 10 persons) according to the dressings in use.

• **The first group of patients was treated with Pharma-Jelly Net Ag (Fibrotul Ag) dressing** which is a wound lipidocolloid bactericide sterile non-adhesive polymer network-based dressing with Ag ions. Composition: hydrocolloid particles (carboxymethyl cellulose), soft paraffin, Ag (HeiQ AGS-20), cohesive polymers, polyether network. HeiQ AGS-20 is a composite with Ag nanoparticles which are included into the dressing matrix and are a source of Ag ions to inhibit bacteria and fungi growth. Carboxymethyl cellulose particles absorb the exudates and turn into a cohesive gel with soft paraffin which has a synergizing atraumatic effect. This forms a lipid colloid complex that prevents the dressing from adhering to the wound bed and surrounding tissues creating a moist environment. When applied to the wound or changed, the dressing is painless and atraumatic. The medical product is easily shaped to the anatomical contours of the wound. The micro-mesh polyether basis neither flakes nor leaves fibers on the wound bed that makes the dressing procedure easier. The net structure helps the exudates to penetrate into the secondary absorption dressing.

**Indications for use:**

1. Topical burn wounds (thermal, chemical, induced by electrical injury) of I-II degree.
2. Dermal autografts including those with a high perforation factor 1:4.
3. Granulating wounds.
4. Donor wounds.
5. Pressure ulcers.

• **The second group included 10 burned patients** who received topical treatment with **Pharmacoll Ag (Fibrocoll Ag)** dressing, which is a bactericide hydrocolloid sterile adhesive polymer-based dressing with Ag ions. Based on the polymer semi-permeable polyurethane film with a planimetric net covered with an adhesive matrix containing hydrocolloid particles (of carboxymethyl cellulose) and Zeomic particles (antibacterial Ag ion containing zeolite) impregnated through the entire dressing surface. Zeomic is an antibacterial zeolite consisting of composite structures containing Ag ions in silicon dioxide matrix (SiO<sub>2</sub>). This substance provides high toxic safety and creates sufficient antimicrobial Ag concentrations. Pharmacoll Ag absorbs the wound exudates, forms a gel creating a moist environment in the wound. Due to this gel the dressing is not stuck to the wound and can easily and painlessly be removed. The transparent dressing base makes it possible to control the wound condition and gel formation.

**Indications for use:**

1. Topical burn wounds (thermal, chemical, induced by electrical injury) of II-III degree.
2. Wound preparation for autografting.
3. Granulating wounds.
4. Pressure ulcers (in case of neurotrophic disorders associated with a spinal cord injury).

• **The third group included 10 children** whose burn wounds were treated with a hydrogel bactericide non-adhesive polymer-based dressing **Pharmagel Ag (Silkofix Gel Ag)**. Its properties: bactericide, contains Ag ions, has a mild cooling effect and high absorptive capacity, transparent, impermeable for bacteria; its micromesh base provides air and moisture exchange; it is hypoallergenic. It is based on a polymer polyurethane film covered with Ag ions containing hydrogel.

#### **Indications for use:**

1. Topical burn wound (thermal, chemical, induced by electrical injury) of the I-II degree.
2. Dermal autografts including those with a high perforation factor 1:4.
3. Granulating wounds.
4. Donor wounds.
5. Pressure ulcers.

**Pharmagel Ag** and **Pharmacoll Ag** medical products are similar in the mechanism of action in the wound. The difference between them is that **Pharmacoll Ag** adheres well to the healthy skin surrounding the wound and is easy to remove when the dressing is changed. **Pharmagel Ag** is easily molded on the wound but can dislocate that requires its additional fixation to the healthy skin.

• **10 patients of the fourth group** received topical conservative treatment with **Vilowond POVI (Silkofix POVI)**. It is a povi-done-iodine ointment, fabric net-based dressing. Its properties are as follows: bactericide, atraumatic and airproof.

#### **Indications for use:**

1. Topical burn wounds (thermal, chemical, induced by electrical injury) of the I-II degree.
2. Infected wounds.
3. Granulating long non-healing wounds.
4. Burn wounds complicated with a herpetic infection.
5. Infected postoperative wounds.
6. Donor wounds.
7. Wounds after graft edge lysis
8. Pressure ulcers.

• The efficacy of each medical product was assessed using clinical and laboratory figures. Particularly, we considered the age of injured persons, type of the thermal agent (Table 1), burn wound area, extent of tissue injury, duration of wound bed self-epithelialization, period of skin graft acceptance, number of dressings, bleeding sickness when dressings are changed, nature of wound exudates, side reactions (Table 2) as the criteria of clinical efficiency of medical products.

**Table 1. Patient grouping as to their age and type of a thermal agent**

Study characteristics	Dressing			
	PharmaJelly Net Ag	Pharmacoll Ag	Pharmagel Ag	Vilowond POVI
Age, years	2.8 (1.3; 4)	1.4 (1;3)	1.2 (1;2.1)	1 (1.1; 2.1)
Thermal Agent:	Number, person			
Hot Fluid	7	10	6	5
Flame	3	-	1	-

As it comes from Table 1, the dressings were used in children of the first 3 years of life, who were mostly injured with hot liquid as a thermal agent.

**Table 2. Patient grouping as to clinical characteristics of the burn wound process.**

Clinical characteristics of the wound process	Dressing			
	PharmaJelly Net Ag	Pharmacoll Ag	Pharmagel Ag	Vilowond POVI
Wound area, % of body surface area	3 (1.5; 6)	5.5 (4;9)	2 (1;4)	1.5 (0.5; 2)
Wound epithelization period, days	8(6;0)	8 (7;9)	10 (7;12)	12 (10;15)
Dermal autograft acceptance period, days	7 (6;7)	-	-	8.5 (9;12)
Number of dressings	2 (2;3)	2 (2;3)	2 (2;3)	3 (2;5)
Presence of exudation	Scanty	Excessive	Moderate	Low
Side effects	No	Rare (1%)	No	No
Bleeding sickness when dressings are changed	No	No	No	Moderate

Treatment of local superficial  
burns with  
**PharmaJelly Net Silver &  
Pharmacoll Ag**



Treatment of local superficial  
burns with **Pharmagel Ag**





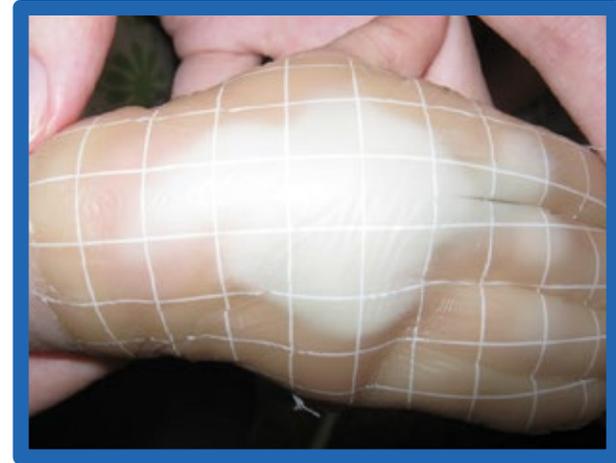
Application of **PharmaJelly Net**  
**Ag** after grafting



Application of **Vilowond POVI**  
after plastic by local fabrics



Treatment of granulated wounds  
with **Pharmacoll Ag**





Treatment of granulated wounds with **Pharmacoll Ag**



The laboratory tests of wound process meant monitoring of the microbial landscape of burn wounds at the stages of their healing (Table 3).

**Table 3. Characteristics of the microbial landscape of burn wounds treated with modern dressings.**

Microbial landscape	Dressing								
	PharmaJelly Net Ag		Pharmacoll Ag		Pharmagel Ag		Vilowond POVI		
	Before	After	Before	After	Before	After	Before	After	
Pure culture			+		+				
Mixed flora	+			+		+		+	
No growth		+							+

The table data illustrate the antimicrobial activity of the tested dressings.

- The following recommendations for use of these dressings can come from the analysis of the use of the medical products in the topical conservative treatment of children with burn wounds.
- Recommendations for the use of the PharmaJelly Net Ag, Pharmacoll Ag, Pharmagel Ag, Vilowond POVI dressings:
  1. Any of the above listed dressings can be used as monotherapy:
    - for I-II degree partial-thickness burns - PharmaJelly Net Ag;
    - for II-III degree skin burns which are so-called mosaic burns - Pharmacoll Ag, Pharmagel Ag.
  2. For long non-healing granulating wounds of less than 1% body surface area as well as for the presence of herpetic infection seeding in the wound bed - Vilowond POVI.
  3. After the burn wound debridement - Pharmacoll Ag or Silkofix Gel Af (as a monotherapy until full epithelialization of the wound bed).
  4. To prepare a granulating wound for autografting use Pharmacoll Ag or Pharmagel Ag.
  5. For atopic dermatitis, acute allergic reaction in the form of a toxic allergic reaction or urticaria or maceration of the health skin surrounding the wound - PharmaJelly Net Ag or Vilowond POVI.
  6. For III degree burns it is reasonable to use a few types of dressing. Thus, on the first day after trauma in case of an ambiguous “finger test” for the determination of the extent of injury at the onset of the disease, Pharmacoll Ag (it contributes to formation of circumscribed edges of full- and partial-thickness burns) should be used. At the stage of dermal autografting, use PharmaJelly Net Ag (onto transplanted skin grafts). In case of early postoperative local infectious complications in the form of infected wound in cells of transplanted graft or their partial lysis, use Vilowond POVI.
  7. For II-III mosaic burns, use a few types of dressing: during the primary examination of the injured person, apply PharmaJelly Net Ag on the green wound, then after determination of the tissue injury extent, use Pharmacoll Ag or Pharmagel Ag, then after wound cleansing of fibrins use PharmaJelly Net Ag until full epithelialization of the affected area.

During the research we calculated the cost of the topical treatment for one patient with topical burns of up to 10% of the body surface with use of two dressings **PharmaJelly Net Ag** and **Pharmacoll Ag**. The data are presented in Tables 4 and 5.

- **Table 4. Estimation of the cost of treatment for one patient with PharmaJelly Net Ag**  
**The cost of one PharmaJelly Net Ag dressing (15x15 cm) – 170 roubles 00 kopecks**

Percent Body Surface Area Affected by Burns	Number of PharmaJelly Net Ag Dressings	Consumption of Dressing Material, pcs	Total Cost of Topical Treatment of 1 patient, roubles
up to 10	2	5 (10x15 cm)	850
Dermal autograft for 1 to 5% of the body surface	2	4 (10x15 cm)	680

**Table 5. Estimation of the cost of treatment for one patient with Pharmacoll Ag**  
The cost of one Pharmacoll Ag dressing (15x15 cm) – 240 roubles 00 kopecks

Percent Body Surface Area Affected by Burns	Number of Dressings with Pharmacoll Ag	Consumption of Dressing Material, pcs	Total Cost of Topical Treatment of 1 patient, roubles
up to 11	2	4 (15x15 cm)	480
11 to 30	4	10 (15x15 cm)	4,800

## Conclusions:

Therefore, medical products **PharmaJelly Net Ag, Pharmacoll Ag, Pharmagel Ag, Vilowond POVI Gauze** can successfully be used in pediatric combustiology for topical conservative treatment of I-II-II degree burn wounds irrespective of the type of the thermal agent.

The above mentioned dressings can successfully be used for healing of wounds of any causation in various medical and preventive treatment facilities of Russia.