Clinical and other Notes.

CARBON DIOXIDE SNOW WITH SPECIAL REFERENCE TO THE TREATMENT OF ORIENTAL SORES.

By Captain T. J. Mitchell.  
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The treatment of certain skin diseases by refrigeration with carbon dioxide snow is well known, and many civil hospitals at home use it extensively. After experimenting with it for two years, I think the results warrant its more extensive use in the East.

The apparatus required is simple and inexpensive; it consists of: (1) a cylinder of CO₂ which may be obtained from the nearest soda water factory. The cost of a full cylinder is Rs. 20; (2) a collecting chamber and mould which can be made in the bazaar for a few rupees.

One mould is sufficient and the collecting chamber can be dispensed with, if the following simple method is employed.

Two layers of thick blotting paper are rolled tightly round a cylindrical office ruler. A towel is rolled round the blotting paper. The ruler is extracted and one end of the tube thus formed is closed, by doubling up the end of the towel and fixing it with a safety pin. The open end is fitted to the valve of the cylinder and fixed by a bandage.

The cylinder of CO₂ is placed in the vertical position with the valve lowermost. The CO₂ is turned on very gently and allowed to escape until the towel feels hard and solid.

The CO₂ snow is next transferred to a brass mould made like a bottle filler; the stem is fitted with a cap. The CO₂ snow is forced into the
stem and compressed by a brass rod. A pencil of CO₂ snow is formed and can be forced through the stem on removing the cap.

A double piece of lint rolled round the end of the pencil is sufficient to protect the operator's figures.

A well formed and hard pencil has the following advantages: (1) It lasts longer; (2) the pressure on the affected part is more even and better results are obtained; (3) it can be shaped by a scalpel.

![Image of CO₂ setup with collector and mold]

Fig. 1.—Cylinder of CO₂ with collecting chamber and mould attached. On the table different moulds are arranged, pencil of CO₂ snow on the extreme right.

The snow has a temperature of -79°C, and when pressed hard on the skin it freezes the underlying structures, and the frozen area becomes white, depressed and hard.

As thawing takes place redness and turgescence of the part is noticed, and a blister forms in twenty-four to forty-eight hours. Healing goes on under a crust and the resulting cicatrix is smooth, white and pliable.

The effect produced by the CO₂ snow depends on: (1) The pressure used; (2) the duration of the application.
The two factors which determine the pressure and duration are: (1) Situation; (2) depth of the lesion; a superficial lesion over the bony surface of the tibia will require less pressure and a shorter application than a deep lesion over the fleshy muscles of the thigh.

The application usually lasts from five to thirty seconds. The shorter application is necessary: (1) Over a part where the blood supply is poor; (2) when a slight stimulating effect is required; (3) on children.

An interval of ten to fourteen days is allowed between the applications.

The good results obtained are due, not to a bactericidal action but to: (1) Thrombosis of the blood-vessels; (2) exudation of lymph followed by the absorption of the inflammatory products.

Fig. 2.—Application of CO₂ snow.

Pain.—This depends a good deal on the personal factor. A sharp, stinging pain is experienced when the CO₂ snow is applied; and when the part is thawing a dull pain may be complained of for a few hours. The pain is never severe enough to prevent a patient undergoing further treatment.

After Treatment.—A daily cleansing of the part with hydrogen peroxide solution followed by boracic fomentations or boracic ointment gives good results. I have had no bad after-effects such as: (1) Sloughing; (2) scarring; (3) embolism; or (4) shock.

Cases Treated.

(1) Nevi.—Four in number. Two were completely cured and two were greatly improved.
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(2) Warts.—Five cases were completely cured by four or five applications.

(3) Sloughing Ulcers.—Four cases. These healed quickly after one application.

(4) Ringworm.—One case. This disappeared after one application.

(5) Oriental Sore.—Pathologists are agreed that oriental sores are caused by Leishmania tropica, Wright. The infection is supposed to be carried by flies, bugs or other biting insects.

Bugs attack the covered parts of the body, but I have not noticed a single case where a sore developed on the trunk.

Fig. 3.—White depressed hard area; result of application of CO₂ snow.

Wenyon, who has been working at oriental sore in Asia Minor, states that the disease can be acquired and yet not show any clinical manifestations until five or six months after the period of infection.

I have treated 300 cases of these sores. All were not examined microscopically, and from only a few of those who were so examined could the Leishmania tropica, Wright, be demonstrated.

My diagnosis depended on the clinical features and history.

The sufferers were both Europeans and natives.

The King’s Regiment alone had in 1912, 24 cases admitted to hospital and 50 cases treated out of hospital.

The numbers in 1913 were 7 cases admitted to hospital, and 80 treated out of hospital.
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All either developed sores while stationed in Fort Lahore or a short time after they had returned to cantonments.

No case occurred among the soldiers in the band. They are never stationed in the Fort; only one case reported sick from the R.A., and he frequently visited the Fort.

Situation.—The sores were situated on the exposed parts of the body.

<table>
<thead>
<tr>
<th>Part of Body</th>
<th>Cases</th>
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<tbody>
<tr>
<td>Face</td>
<td>60</td>
</tr>
<tr>
<td>Neck</td>
<td>12</td>
</tr>
<tr>
<td>Trunk</td>
<td>Nil</td>
</tr>
<tr>
<td>Upper arm</td>
<td>6</td>
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<tr>
<td>Elbow-joint</td>
<td>42</td>
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<tr>
<td>Forearm</td>
<td>30</td>
</tr>
<tr>
<td>Hand</td>
<td>78</td>
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<tr>
<td>Thigh</td>
<td>Nil</td>
</tr>
<tr>
<td>Knee-joint</td>
<td>36</td>
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<tr>
<td>Leg</td>
<td>24</td>
</tr>
<tr>
<td>Foot</td>
<td>12</td>
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Fig. 4.—Large white smooth cicatrix; a few spots not completely healed.

Duration.—This varied from fourteen days to two and a half years. Average duration four months.

Size.—The size varied from three inches by two inches to a sixpenny piece.

Variety.—Four distinct clinical types were noticed.

(1) Ulcerating sore with hard raised margins. The sore was covered by a hard crust.
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(2) A small hard, dark red, slightly raised nodule about the size of a sixpenny piece, usually present on the hands and face.

(3) A large red raised surface with desquamation. This form of sore was common round a joint, e.g., elbow.

(4) An ulcerating surface covered by protuberant, foul granulations. This was most common on mucous surfaces and round the ankles and feet in native patients.

These varieties might not be considered true oriental sores owing to my failure to demonstrate the *Leishmania tropica*, Wright; or they might be considered different stages of the sore, but prolonged observation and a consideration of their history, course, and reaction to treatment are convincing proofs that they are separate and distinct varieties.

The first sixty sores were treated entirely by applying CO₂ snow at intervals of ten days. The results were, in the majority of cases, satisfactory. The simple ulcerating cases reacted well, but I was disappointed in those cases where the sore was raised above the skin surface or was covered by foul granulations.
These cases I now anaesthetize and, after thoroughly disinfecting the surface and surrounding tissue of the sore, scrape with a Volkman's spoon, paying great attention to the margin of the sore as healing is often sound in the centre, but the margins break down afterwards. The snow is applied before the patient becomes conscious.

The results have been excellent. Scraping alone does not give the same result. My last few cases have all been foul, fungating sores.

One case, an officer in the H.L.I., was sent up from Umballa with a fungating sore on his lip. He had been under treatment for several months, and the Leishmania tropica, Wright, had been demonstrated at the Research Institute at Kasauli. This sore was scraped and had two applications of snow. He made an excellent recovery.

Another case sent from Nowshera had suffered from a sore on his upper arm for two and a half years. He had undergone every form of treatment—even excision and skin grafting. He required four applications and was then sent back with a sound pliable scar. The majority of cases, after scraping, only require one or two applications.

When a sore dries up and leaves a raised, uneven, desquamating scar there is a temptation to discharge the patient. This should not be done. A recurrence of the sore takes place sooner or later, and all the trouble begins over again.

The aim of all forms of treatment is to obtain a healthy, soft and pliable cicatrix. Many drugs and preparations have been used and recommended. I do not claim that the CO₂ snow treatment alone is a panacea for all such sores, but I do think that, with perseverance and care, this form of treatment lessens the duration of the disease and gives better results, as shown by the healthy, soft, pliable cicatrix, and reduces the liability to recurrence more than any other treatment tried in Lahore Cantonment. It reduced the admissions to hospital from twenty-four to seven, although more cases were treated, as the patient in many cases can attend hospital as out-patient. The treatment is simple and inexpensive.

IMPROVED METHOD OF CARRYING A WOUNDED MAN BY A SINGLE BEARER.

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During manoeuvres and regimental training in several parts of India the following method of carrying a wounded man by a single bearer has been practised in place of the back lift as described on p. 138, "Royal Army Medical Corps Training, 1911." Regimental bearers have invariably told me afterwards that they could always carry a man much further and much more easily by this method than by the old back lift, and