Wound Care in Haiti:

After the earthquake

PRESENTERS:

JOHN MACDONALD MD FACS

ADLER FRANCIUS MD

DAVID KEAST BSC MSC DIP ED MD CCFP FCFP

Introduction

Attendees at this session learned about the development of the Wound Care Program at Hôpital Bernard Mevs in Port-au-Prince, Haiti. The program was launched after the devastating earthquake of January 12, 2010.

Dr. Macdonald began by noting some sobering statistics regarding the earthquake, which lasted for only 1 minute but resulted in untold damage:

- In a population of 10.5 million, 3 million people were directly affected.
- The estimated number of resultant deaths was 300,000; more than 7,000 people were buried in mass graves.
- 1.5 million people were rendered homeless; indeed, today, approximately 450,000 people continue to live in tent cities.
- The estimated number of injured was 300,000; more than 4,000 amputations were performed in the months following the earthquake.
- More than 200 healthcare personnel were killed or injured.

On January 14, 2010 – just days after the earthquake – Dr. Macdonald and his medical colleagues travelled to Port-au-Prince. "At the beginning, there were only 7 doctors, and no nurses," he recalled. "There was no running water or toilets, and no antibiotics were available; we kept morphine tablets in our pockets that we fed to patients to relieve their pain."

Dr. Macdonald estimated that about 80% of the people affected by the earthquake had wounds. The following wound morbidities were encountered:

- crush injuries, i.e. laceration, avulsion;
- compound fractures;
- compartment syndrome;
- rhabdomyolysis;
- post-operative amputations;
- split thickness skin grafts;
- external fixation;
- vacuum-assisted closure (VAC) application and maintenance; and
- burns.

Because antibiotics were unavailable, many amputations had to be done. "So many wounds had become infected that we had no other options," said Dr. Macdonald. "The first amputation was performed just days after the earthquake, on a card table, and under local anesthesia."

A tent hospital was built, using money available from donated funds. One tent was dedicated specifically to wound care; however, there was still no running water.

The traumatic wound protocol for acute wounds was as follows:

- irrigation and debridement (saline, betadine and Dakins solution);
- topical antibiotics (silver sulfadiazine, betadine-soaked gauze);
- Vaseline-impregnated gauze (Xeroform); and
- gauze cover dressing + Kerlex + Coban.

For chronic wounds, the traumatic wound protocol was as follows:

- dressing change every 2 to 3 days;
- debridement;
- saline irrigation;
- topical silver;
- Vaseline Gauze (Xeroform);

Canadian Association of Wound Care initiatives in Haiti

In an effort to provide support for wound care initiatives in Haiti, the Canadian Association of Wound Care donated a number of CAWC Institute of Wound Prevention and Management educational materials – including slides, workbooks and web-based resources – to Hôpital Bernard Mevs/Project Medishare Wound Clinic.

"We are pleased to be able to provide these invaluable materials to such a worthy endeavour," says Peggy Ahearn, Executive Director of the CAWC. "We look forward to an ongoing partnership with Dr. Francius and hope we can contribute to the success of his work."

John Macdonald is the medical director of the University of Miami Lymphedema Clinic in Fort Lauderdale, Florida.

Adler Francius is with Project Medishare at Hôpital Bernard Mevs Wound Clinic in Port-au-Prince, Haiti.

David Keast is centre director of the Aging, Rehabilitation and Geriatric Care Research Centre at St Joseph's Parkwood Hospital in London, Ontario.

- Kerlex and Coban wrap; and
- VAC application.

Noted Dr. Macdonald, "We had to make the protocols very simple, because the medical volunteers knew nothing about wound care."

By February 2012, 1.2 million people were still living in tents; however, more volunteer doctors and nurses continued to arrive, and the chaos began to come to order.

With respect to human resources, the following teams were formed:

- Bedside care and triage: 2 mobile teams of 2 to 3 people each.
- Pediatric surgical: Team of 2 to 3 people for all dressing changes, with conscious sedation.
- Adult surgical: Team of 3 to 4 people for major debridement and VAC, with conscious sedation.
- Outpatient care: 2- to 4-member team for dispensary and wound care.

The sheer volume of wound care required was staggering. Dr. Macdonald discussed "wound care by the numbers," and noted the following:

- 80% of patients affected by the earthquake had wounds.
- 140 amputations were performed in the first 30 days after the earthquake.
- 160 wound dressing were changed per day.
- 75 outpatients with wounds were seen per day.

The 20-bed clinic that was first set up after the earthquake is now a 60-bed hospital. To ensure that effective wound management was being carried out, the World Health Organization guidelines entitled *Wound and Lymphoedema Management* were used.[1]

Hôpital Bernard Mevs/ Project Medishare Wound Clinic

Dr. Francius discussed the Hôpital Bernard Mevs/ Project Medishare Wound Clinic in Haiti. He noted that the clinic currently sees an average of 45 patients per day. Approximately 40% of wounds treated are surgical wounds, while another 40% are traumatic wounds.

Initially, the clinic's primary focus was on dressing changes. Now, with the assistance of physicians from other wound care centres – including Dr. Macdonald's team in Miami – the clinic is undertaking the following initiatives:

- applying critical thinking to the prevention, management and healing of wounds;
- discussing and questioning the best treatment and dressing options for each and every patient; and
- documenting wound statistics.

Dr. Francius concluded his presentation by noting that his dream for the Hôpital Bernard Mevs/Project Medishare Wound Clinic is to become a centre of excellence to treat, teach and train, where patients are happy, healthy and healed!

Reference

1. World Health Organization. Wound and Lymphoedema Management. Geneva, Switzerland: World Health Organization; 2000.

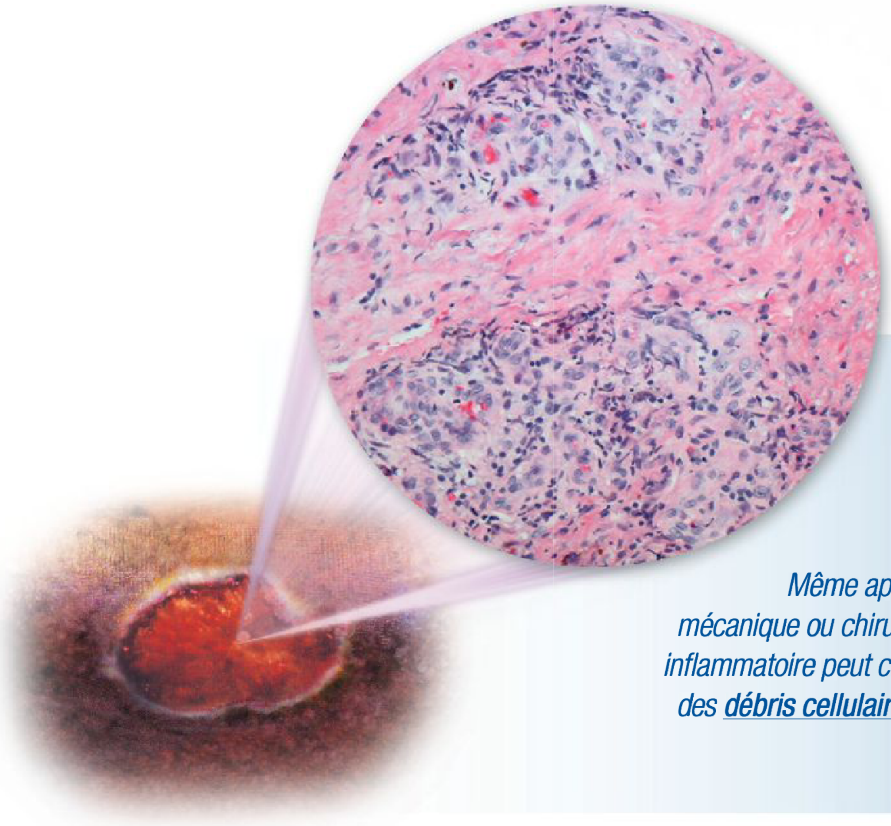
Suggested Reading: Assessing and Managing Arterial Ischemic Pain

1. Forst T, Nguyen M, Forst S, et al. Impact of low frequency transcutaneous electrical nerve stimulation on symptomatic diabetic neuropathy using the new Salutaris device. *Diabetes Nutr Metab*. 2004;17:163-168.
2. Goldman R, Rosen M, Brewley B, Golden M. Electrotherapy promotes healing and microcirculation of infrapopliteal ischemic wounds: a prospective pilot study. *Adv Skin Wound Care*. 2004;17:284-294.
3. Goldman R, Brewley B, Zhou L, Golden M. Electrotherapy reverses inframalleolar ischemia: a retrospective, observational study. *Adv Skin Wound Care*. 2003;16:79-89.
4. Goldman RJ, Brewley BI, Golden MA. Electrotherapy reoxygenates inframalleolar ischemic wounds on diabetic patients: a case series. *Adv Skin Wound Care*. 2002;15:112-120.
5. Humpert PM, Morcos M, Oikonomou D, et al. External electric muscle stimulation improves burning sensations and sleeping disturbances in patients with type 2 diabetes and symptomatic neuropathy. *Pain Med*. 2009;10:413-419.
6. Klassen A, Di Iorio B, Guastaferro P, et al. High-tone external muscle stimulation in end-stage renal disease: effects on symptomatic diabetic and uremic peripheral neuropathy. *J Ren Nutr*. 2008; 18:46-51.
7. Musaev AV, Guseinova SG, Imamverdieva SS. The use of pulsed electromagnetic fields with complex modulation in the treatment of patients with diabetic polyneuropathy. *Neurosci Behav Physiol*. 2003;33:745-752.
8. Oyibo SO, Breislin K, Boulton AJ. Electrical stimulation therapy through stocking electrodes for painful diabetic neuropathy: a double blind, controlled crossover study. *Diabet Med*. 2004; 21:940-944.
9. Peters EJ, Lavery LA, Armstrong DG, et al. Electric stimulation as an adjunct to heal diabetic foot ulcers: a randomized clinical trial. *Arch Phys Med Rehabil*. 2001;82:721-725.
10. Pieber K, Herceg M, Paternostro-Sluga T. Electrotherapy for the treatment of painful diabetic peripheral neuropathy: a review. *J Rehabil Med*. 2010;42:289-295.
11. Registered Nurses' Association of Ontario. *Assessment and Management of Pain*. Toronto, ON: Registered Nurses' Association of Ontario; 2002.
12. Reichstein L, Labrenz S, Ziegler D, et al. Effective treatment of symptomatic diabetic polyneuropathy by high-frequency external muscle stimulation. *Diabetologia*. 2005;48:824-828.
13. Weintraub MI, Cole SP. Pulsed magnetic field therapy in refractory neuropathic pain secondary to peripheral neuropathy: electrodiagnostic parameters – pilot study. *Neurorehabil Neural Repair*. 2004;18:42-46.
14. Weintraub MI, Wolfe GI, Barohn RA, et al; Magnetic Research Group. Static magnetic field therapy for symptomatic diabetic neuropathy: a randomized, double-blind, placebo-controlled trial. *Arch Phys Med Rehabil*. 2003;84:736-746.
15. Wróbel MP, Szymborska-Kajanek A. Impact of low frequency pulsed magnetic fields on pain intensity, quality of life and sleep disturbances in patients with painful diabetic polyneuropathy. *Diabetes Metab*. 2008;34(4 Pt 1):349-354.

When wounds are trapped in the inflammatory phase, debridement is not complete…

Lorsque les plaies sont piégées dans la phase inflammatoire, le débridement n'est pas complet…

Break the Cycle • Brisez le cycle



Even after sharp or surgical debridement, inflammatory processes can continue to generate ***microscopic cellular debris***

Même après un débridement mécanique ou chirurgical, le processus inflammatoire peut continuer de générer des ***débris cellulaires microscopiques***

- Collagenase SANTYL® Ointment selectively targets collagen without harming healthy tissue
- Continuous, active micro-debridement with SANTYL® Ointment can help wounds progress from the inflammatory to the proliferative phase of healing

Visit **www.santyl.ca** for more details.

- L'onguent SANTYL® avec collagénase cible le collagène de manière sélective sans endommager les tissus sains
- Le microdébridement actif continu avec l'onguent SANTYL® peut aider les plaies à progresser de la phase inflammatoire à la phase proliférante de guérison

Visitez **www.santyl.ca** pour plus de détails.

Occasional slight transient erythema has been noted in surrounding tissue when applied outside the wound. One case of systemic hypersensitivity has been reported after 1 year of treatment with collagenase and cortisone.

Use of Collagenase SANTYL® Ointment should be terminated when debridement is complete and granulation tissue is well established.

Please see complete Prescribing Information on adjacent page.

On a noté un érythème occasionnel et léger sur les tissus environnants lorsque l'application de l'onguent dépasse le pourtour de la plaie. Un cas d'hypersensibilité systémique a été rapporté après un an de traitement à la collagénase et à la cortisone.

L'utilisation de l'onguent SANTYL® avec collagénase devrait être cessée lorsque le débridement est complété et que la granulation est bien entamée.

Veuillez consulter l'information posologique complète sur la page adjacente.

Collagenase Santyl® Ointment 250 units/g

The Continuous, Active Micro-Debrider

1-800-441-8227 **www.healthpoint.com**

 IN1126-0310

Collagénase Santyl® Onguent 250 unités/g

L'agent de microdébridement actif continu

Collagenase Santyl®

Ointment 250 units/g

Supports natural healing

DESCRIPTION: Santyl® (collagenase) ointment is a sterile topical enzymatic debriding agent that contains 250 units of collagenase per gram of white petrolatum USP. The enzyme collagenase is derived from the fermentation of *Clostridium histolyticum*. It possesses the unique ability to selectively digest denatured and undenatured collagen that binds necrotic debris to the wound surface.

CLINICAL PHARMACOLOGY: Santyl® (collagenase) possesses the ability to digest insoluble collagen, undenatured and denatured, by peptide bond cleavage, under physiological conditions of pH and temperature. This ability makes it particularly effective in the removal of detritus from dermal lesions, contributing towards the more rapid formation of granulation tissue and subsequent epithelization of dermal ulcers and severely burned areas. Collagen in healthy tissue or in newly formed granulation tissue is not digested.

INDICATIONS: Santyl® (collagenase) is a sterile ointment indicated for the debridement of dermal ulcers or severely burned areas.

CONTRAINDICATIONS: Application is contraindicated in patients who have shown local or systemic hypersensitivity to collagenase.

WARNINGS: Debilitated patients should be closely monitored for systemic bacterial infections because of the theoretical possibility that debriding enzymes may increase the risk of bacteremia.

PRECAUTIONS: The enzyme's optimal pH range is 6 to 8. Significantly lower pH conditions have a definitive adverse effect on the enzyme's activity, and appropriate precautions should be carefully taken. The enzymatic activity is also adversely affected by detergents, hexachlorophene and heavy metal ions such as mercury and silver that are used in some antiseptics and by cobalt, magnesium and manganese. When it is suspected such materials have been used, the site should be carefully cleansed by repeated washings with normal saline before Santyl® (collagenase) ointment is applied. Soaks containing metal ions or acidic solutions such as Burow's solution should be avoided because of the metal ion and low pH. Cleansing materials such as hydrogen peroxide or Dakin's solution followed by sterile normal saline do not interfere with the activity of the enzyme. The ointment should be confined to the area of the lesion in order to avoid the possible risk of irritation or maceration of normal skin; however, the enzyme does not damage newly forming granulation tissue. A slight erythema has been noted occasionally in the surrounding tissue particularly when the enzyme ointment was not confined to the lesion. This can be readily controlled by protecting the healthy skin with a material such as zinc oxide paste. Since the enzyme is a protein, sensitization may develop with prolonged use.

ADVERSE REACTIONS: Although no allergic sensitivity or toxic reactions have been noted in the recorded clinical investigations to date, one case of systemic manifestations of hypersensitivity has been reported in a patient treated for more than one year with a combination of collagenase and cortisone. Irritation, maceration or erythema has been noted where prolonged contact of normal skin with Santyl® (collagenase) ointment has been allowed, either by application of the ointment to areas of normal skin or by excessive application of ointment to the wound crater with subsequent spread to normal skin when dressings are applied. The reported incidence for this type of reaction was 1.8%.

SYMPTOMS AND TREATMENT OF OVERDOSE: Symptoms: To date, the irritation, maceration or erythema reported on prolonged contact of normal skin with Santyl® (collagenase) ointment constitute the only symptoms of overdosage reported. **Treatment:** Santyl® (collagenase) ointment can be rendered inert by the application of Burow's solution USP (pH 3.6 - 4.4) to the treatment site. If this should be necessary, reapplication should be made only with caution.

DOSAGE AND ADMINISTRATION: For external use only. Santyl® (collagenase) ointment should be applied once daily, or more frequently if the dressing becomes soiled (as from incontinence) in the following manner: **(1)** Prior to application the lesions should be gently cleansed with a gauze pad saturated with sterile normal saline, to remove any film and digested material. If a stronger cleansing solution is required, hydrogen peroxide or Dakin's solution may be used, followed by sterile normal saline. **(2)** Whenever infection is present, as evidenced by positive cultures, pus, inflammation or odor, it is desirable to use an appropriate antibacterial agent. Should the infection not respond, therapy with Santyl® (collagenase) ointment should be discontinued until remission of the infection. **(3)** Santyl® (collagenase) ointment should be applied (using a tongue depressor or spatula) directly to deep wounds, or when dealing with shallow wounds, to a non-adherent dressing or film dressing which is then applied to the wound. The wound is covered with an appropriate dressing such as a sterile gauze pad and properly secured. **(4)** Use of an occlusive or semi-occlusive dressing may promote softening of eschar, if present. Alternatively, crosshatching thick eschar with a #11 blade is helpful in speeding up debridement then cleanse with sterile saline. It is also desirable to remove as much loosened detritus as can be done readily with forceps and scissors. **(5)** All excess ointment should be removed each time the dressing is changed. **(6)** Use of Santyl® (collagenase) ointment should be terminated when debridement of necrotic tissue is complete and granulation is well under way.

HOW SUPPLIED: Available in 30 gram tubes of ointment. Sterile until opened. Contains no preservative. Do not store above 25°C.

Product monograph available upon request.

Marketed by
HEALTHPOINT®
A DFB COMPANY
1-800-441-8227

Healthpoint Canada ULC
Peterborough, Ontario, K9J 7A5
1-800-441-8227
129041-0209

DIN 02063670
Reorder No
0064 5011 30 (30 g tube)

Collagénase Santyl®

Onguent 250 unités/g

Favorise la guérison naturelle

DESCRIPTION : Santyl® (collagénase) onguent est un agent de débridement topique stérile enzymatique qui renferme 250 unités de collagénase par gramme de pétrolatum blanc U.S.P. L'enzyme collagénase est dérivée de la fermentation de *Clostridium histolyticum* possédant le pouvoir unique de digérer de manière sélective le collagène aussi bien naturel que dénaturé qui lie les fibres nécrosées à la surface de la plaie.

PHARMACOLOGIE CLINIQUE : Santyl® (collagénase) a la capacité de digérer le collagène insoluble, non dénaturé et dénaturé, par clivage de la liaison peptidique à un pH et à une température physiologiques. Cette caractéristique le rend particulièrement efficace dans l'élimination des déchets des lésions dermiques favorisant ainsi la formation du tissu de granulation et l'épithélialisation ultérieure des zones dermiques ulcérées et gravement brûlées. Le collagène des tissus sains ou du nouveau tissu de granulation n'est pas digéré.

INDICATIONS : Santyl® (collagénase) est un onguent stérile indiqué pour le débridement des zones dermiques ulcérées ou gravement brûlées.

CONTRE-INDICATIONS : L'application est contre-indiquée chez les patients ayant présenté une hypersensibilité locale ou systémique à la collagénase.

MISE EN GARDE : Les patients atteints de conditions débilitantes doivent être surveillés étroitement pour éviter la généralisation des infections bactériennes. Les enzymes de débridement augmenteraient le risque de bactériémie.

PRÉCAUTIONS : Le pH optimal de l'enzyme est de 6 à 8. Un pH nettement inférieur à un effet nettement adverse sur l'action de l'enzyme et des précautions appropriées doivent alors être prises. L'action de l'enzyme est également contrariée par les détergents, l'hexachlorophène et les ions de métaux lourds, comme le mercure et l'argent, présents dans certains antiseptiques, et par le cobalt, le magnésium et le manganèse. Quand on soupçonne l'utilisation de ces produits, la zone affectée doit être soigneusement nettoyée par des lavages répétés avec une solution saline avant l'application de l'onguent Santyl® (collagénase). Les bains contenant des ions de métaux ou des solutions acides comme la solution de Burow doivent être évités en raison de l'ion métal et du faible pH. Les solutions nettoyantes comme l'eau oxygénée ou la solution de Dakin suivie d'une solution stérile saline n'entravent pas l'action de l'enzyme. L'application de l'onguent doit se limiter à la zone affectée pour éviter le risque possible d'irritation ou de macération de la peau saine. Cependant, l'enzyme n'altère pas le nouveau tissu de granulation. Un érythème bénin dans le tissu avoisinant pourrait se produire. Cela peut facilement être évité en protégeant la peau saine avec un produit comme de la pâte d'oxyde de zinc. Compte tenu de la nature protéique de l'enzyme présent dans le médicament, son emploi prolongé pourrait amener une sensibilisation.

EFFETS SECONDAIRES : Bien qu'aucune sensibilité allergique ni réaction toxique n'aient été notées à ce jour dans les compte rendus d'études, on a signalé un cas de manifestations systémiques d'hypersensibilité chez un patient traité pendant plus d'un an avec une association de collagénase et de cortisone. On a noté de l'irritation, de la macération ou de l'érythème dans le cas de contact prolongé de la peau normale avec l'onguent Santyl® (collagénase), soit par application de l'onguent sur les régions normales de la peau, soit par application excessive de l'onguent dans le cratère de la plaie, permettant à celui-ci de s'étendre à la peau normale lors de l'application des pansements. L'incidence signalée de ce type de réaction était de 1,8%.

SYMPTÔMES ET TRAITEMENT DU SURDOSAGE: Symptômes: Jusqu'ici, l'irritation, la macération ou l'érythème signalés en cas de contact prolongé de la peau saine avec l'onguent Santyl® (collagénase) représentent les seuls symptômes signalés de surdosage. **Traitement :** On peut rendre l'onguent Santyl® (collagénase) inerte en appliquant la solution de Burow U.S.P. (pH 3.6-4.4) sur la plaie. La réapplication du produit, si elle est considérée nécessaire, ne se fera qu'avec prudence.

POSOLOGIE ET ADMINISTRATION : Pour usage externe seulement. L'onguent Santyl® (collagénase) doit être appliqué une fois par jour ou plus fréquemment si le pansement se souille (à cause d'incontinence par exemple) de la façon suivante : **(1)** Avant application, les lésions doivent être nettoyées doucement avec une gaze saturée d'une solution stérile saline normale pour enlever toute pellicule et toute matière digérée. Si l'on a besoin d'une solution nettoyante plus puissante, on peut utiliser de l'eau oxygénée ou de la solution de Dakin suivie de solution stérile saline normale. **(2)** En cas d'infection, révélée par la présence de cultures positives, de pus, d'une inflammation ou d'une odeur, il serait souhaitable d'employer un agent antibactérien approprié. Il faut interrompre le traitement au Santyl® (collagénase) jusqu'à rémission de l'infection, si l'infection ne se résorbe pas. **(3)** Appliquer Santyl® (collagénase) directement sur les blessures profondes à l'aide d'un abaisse-langue ou d'une spatule. Pour les plaies superficielles, appliquer l'onguent sur une compresse non adhérente ou un pansement transparent à être déposée sur la plaie; puis recouvrir d'un pansement approprié tel une compresse de gaze stérile adéquatement retenue. **(4)** L'utilisation d'un pansement occlusif ou semi-occlusif peut favoriser le ramollissement de l'escarre, le cas échéant. Ou, si l'on hachure une escarre épaisse à l'aide d'une lame numéro 11, on peut accélérer le débridement. Nettoyer alors avec une solution saline stérile. Il est également souhaitable d'enlever autant de détritus lâches que possible à l'aide de pinces et de ciseaux. **(5)** Enlever tout excès d'onguent à chaque renouvellement du pansement. **(6)** Arrêter les applications de l'onguent Santyl® (collagénase) dès que le tissu nécrosé est suffisamment débridé et que le bourgeonnement est bien entamé.

PRÉSENTATION : Disponible en tubes de 30 grammes d'onguent. Stérile dans l'emballage non ouvert. Aucun agent de conservation. Ne pas entreposer au-dessus de 25°C.

Monographie du produit sur demande.

Mis en marché par
HEALTHPOINT®
UNE COMPAGNIE DE DFB
1-800-441-8227

Healthpoint Canada ULC
Peterborough, Ontario, K9J 7A5
1-800-441-8227
129041-0209

DIN 02063670
No de commande
0064 5011 30 (tube de 30 g)