Prevention of pressure injuries/ulcers and skin lesions using Sanyrene®: a narrative review of the evidence

Key words:

- Pressure Injuries
- Pressure ulcers
- Skin lesions
- Sanyrene oil
- Wounds

Abstract: Different strategies have been implemented in hospitals globally to decrease the number of pressure injury/ulcer (PI/PU) incidences, which include risk screening and implementation of specific care bundles. However, PIs are still a prevalent burden persisting in both healthcare facilities and in the community, negatively affecting the health-related quality of life (HRQoL) of patients, as well as contributing to increase in costs of health institutions.

Sanyrene oil is designed and has been shown to help in the prevention of PIs when included in a robust standard of care for prevention, as shown in various publications. Initial evidence states that the oil significantly enhances the oxygenation of the skin tissue. Further evidence is discussed including a real-life prospective study including 1121 patients, implementation of Sanyrene in prevention of device-associated PIs, and prevention of radiodermatitis. Furthermore, better results have been achieved with Sanyrene and standard of care versus standard of care alone. We also present our testimonials regarding our practice and how Sanyrene is included in their daily patient care.

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Pressure ulcers/injuries (PU/PI) are defined as: 'localised damage to the skin and/or underlying soft tissue usually over a bony prominence or related to a medical or other device. The injury can present as intact skin or an open ulcer and may be painful. The Injury occurs as a result of intense and/or prolonged pressure or pressure in combination with shear' (Edsberg et al, 2016). The tolerance of soft tissue for pressure and shear may also be affected by microclimate, nutrition, perfusion, comorbidities and condition of the soft tissue (Edsberg et al, 2016).

Notwithstanding advances in prevention strategies, globally, PI are still very prevalent, with approximately 3,170,796 new cases of different stages reported worldwide in 2019 (Zhang et al, 2021). In a systematic review regarding the global burden of PIs published in 2020, it was indicated that the prevalence of PI in 1,366,848 patients was 12.8%. The most frequently occurred stages were category I (43.5%) and category II (28.0%). The most affected body sites were sacrum, heels and hip, with the authors concluding that that the burden of PIs remains substantial, with more one in ten adult patients admitted to hospitals affected (Li et al, 2021).

Lim and Ang (2017) discussed the cost of hospital-acquired PI (HAPI) in Singapore. They stated compared to those without HAPI, patients with HAPI experienced significantly higher average hospitalisation fees and length of stay (S$35,936 versus S$6,266, $p<0.0005$; 30 days versus 6 days, $p<0.0005$) (Lim and Ang, 2017).

Apart from the financial problem, it is also important to remember that the presence of PIs imposes a huge burden on the patients' quality of life (QoL) and significantly increases their risk of dying (Khor et al, 2014). A meta-analysis indicated that, during a three-year follow-up period, patients whose conditions

are complicated by PIs, are estimated to have a twice higher risk of mortality compared with patients without PIs (Song et al, 2019). It is stated that the impact of PIs on the patients' QoL is significant, taking in consideration the impact of PIs on physical, psychological, emotional, spiritual, social and financial dimensions of life (Repić and Ivanović, 2014). PIs are frequently associated with increased pain, high levels of wound exudate and malodour, but also sleep disturbance, stress and anxiety, and reduces the health-related quality of life (HRQoL) of the patients (Augustin et al, 2021). Furthermore, the impact extends beyond the person with the PI, negatively affecting family members and carers (Young et al, 2018). As many of the patients with PIs may not be able to express their feelings, healthcare professionals should be aware that PIs are painful and unpleasant and manage the issues regarding aspects related to the condition's HRQoL (Moore and Cowman, 2009).

The 2019 International Reference Guide on the Prevention and Treatment of Pressure Ulcers/Injuries (European Pressure Ulcer Advisory Panel et al, 2019), regarding the HRQoL in PI, advise to 'assess the HRQoL, knowledge and self-care skills of individuals with or at risk of pressure injuries to facilitate the development of a pressure injury/[ulcer] care plan and education program' and 'provide pressure injury education, skills training and psychosocial support to individuals with or at risk of pressure injuries'.

The goal of evidence-based practice is to incorporate the best available research, along with clinical experience and patient preference, into clinical practice, so nurses can make informed patient-care decisions (Dang et al, 2022). In this article, we give an overview of the available evidence regarding Sanyrene as a prevention strategy for PIs. We also describe our own experiences using Sanyrene on our patients.

PI prevention

Many PI prevention strategies have been published. The SSKIN bundle, originally created for the National Health Service (UK) has been adapted in different settings. SSKIN is a five-step PI prevention model (McCoulough et al, 2016):

- Surface: make sure your patients have the right support
- Skin inspection: early inspection means early detection. Show patients and carers what to look for
- Keep your patients moving
- Incontinence/moisture: your patients need to be clean and dry
- Nutrition/hydration: help patients have the right diet and plenty of fluids (Santy-Tomlinson and Limbert, 2020).

The 2019 International Reference Guide on the Prevention and Treatment of Pressure Ulcers/Injuries suggest several domains of care regarding Good Practice Statements, including risk factors assessment and preventive skin care (Kottner et al, 2019).

Recently, some dressings have been preconised for the prevention of PI development. For example, it has been suggested to consider applying a polyurethane foam dressing to bony prominences, such as the heels and sacrum, to prevent PI in anatomical areas frequently subjected to friction and shear (Bryne et al, 2016). However, there remains a gap in the literature about the use of dressings to prevent the development of PIs, while a fair amount of data has been generated, study sizes are small and mostly non-randomised in design (Reid et al, 2016).

Interestingly, Huang et al (2021) reported that the use of Sanyrene® before the application of foam dressings significantly reduces the incidence of PI compared with foam alone.

Sanyrene

Sanyrene (also marketed under the brand Corpitol®, Laboratoires Urgo, France), is a skin care oil rich in fatty acid glycerides indicated for the prevention of PIs in at-risk patients and for the prevention of skin lesions induced by prolonged wearing of personal protective equipment (PPE), such as masks or goggles, in healthcare professionals or people in contact with the public. Composed of 99% of maize oil (and 1% of anise perfume), Sanyrene makes the skin more supple (emollient effect) and helps maintain skin oxygenation when the skin is pressed.

According to the manufacturer's instructions for use, the oil is to be sprayed on the skin and gently spread with fingertips for about one minute, without massaging or rubbing in order to avoid skin damage. It should not be applied to a wound or mucous membrane. It is recommended to apply the oil two to four times a day, especially when changing position or before wearing a new mask. Periodicity and frequency of application are important to help prevent PIs or skin wounds induced by prolonged wearing of protective masks or goggles. The local use of Sanyrene should be carried out within a global management of the patient including, for example, off-loading,

frequent repositioning and body mobilisation, repeated full skin inspections, protection against excessive moisture, incontinence management and nutrition.

Clinical evidence behind Sanyrene

Here we aim to provide a narrative review of the evidence behind Sanyrene, the basis of which is why it has been incorporated into PI prevention strategies. As shown through an early randomised control trial (RCT), a reduction in the incidence is observed in patients receiving Sanyrene as local applications versus the absence of treatment or the use of emollient/protective agents (Meume et al, 2005). There has been a renewed interest in Sanyrene oil, as demonstrated by the more recent studies we describe in this article.

Prevention of PI in patients at risk

Under pressure, mechanical forces transmitted throughout the skin can be responsible for tissue ischaemia as well as cell deformation and destruction, which may lead to the formation of PIs (Biggs et al, 2020). Hydration of the skin is essential as dry skin breaks at approximately four times lower strain than hydrated skin (Knotner et al, 2019). When applied to the skin, Sanyrene works like a temporary dressing, primarily via an occlusive effect (Proksch et al, 2019).

Topically applied lipids may exert their effects on the skin by filling the spaces between corneocytes in the outer layers of the stratum corneum (Lodén, 2005), creating a hydrophobic barrier on the skin surface (Proksch et al, 2019), and decreasing the loss of water from the outside of the skin by occlusion (Lodén, 2005). The decrease of transepidermal water loss helps maintain the ability of the stratum corneum intercellular lipids bilayers to absorb, retain and redistribute water (Lodén, 2005; Purnamawati et al, 2017; Proksch et al 2019). This facilitates degradation of corneodesmosomes, prevents corneocytes accumulation while promoting stratum corneum continuity and improves skin mechanics (Purnamawati et al, 2017). Furthermore, they smooth the skin surface, protecting skin from friction (Purnamawati et al, 2017), decreasing the risk of tissue destruction and shear damage. Sanyrene thus supplies the stratum corneum with lipids creating an environment that helps maintain or reinforce the skin protective mechanical properties, so that it prevents tissue ischaemia during pressure (Colin et al, 1998).

Initial clinical evaluation in patients at risk of PI (Colin et al, 1998)

The objective of this clinical trial was to evaluate the efficacy of Sanyrene in patients at risk from PI by measurement of transcutaneous oxygen pressure ($TcPO_2$) at the sacrum. This open label comparative study was conducted in a hospital environment. A total of 28 patients (11 men, 17 women; mean age: 60 years) at risk of PI were included. The first measurement of sacral $TcPO_2$ was taken with the patients lying on their side (lateral decubitus position) in order to obtain the resting value. The second measurement was made with the patients in a dorsal decubitus position (lying on their back) and $TcPO_2$ was measured for an hour during this pressure phase. Another lateral decubitus period and resting pressure were measured after three drops of Sanyrene were applied by a gentle application onto the sacral area. The values recorded are shown in *Table 1*.

In the absence of sacral pressure (in lateral decubitus position), the results showed no significant difference in $TcPO_2$ values before and after application of Sanyrene (R1 and R2). However, under sacral pressure condition (dorsal decubitus position), while the $TcPO_2$ values decreased in both groups, a significantly better oxygenation of the skin tissue (higher $TcPO_2$ values) was reported after Sanyrene application than when it had not been applied (A1 and A2; p=0.014).

Sanyrene and standard of care versus standard of care alone: a RCT in PI prevention (Gallart et al 2001)

This RCT aimed to assess the performance of Sanyrene, in association with standard of care (SoC), in preventing PI compared with SoC alone. The study included 192 patients without a PI, but

Table 1. Transcutaneous oxygen pressure ($TcPO_2$) values recorded (mmHg; Colin et al, 1998)

No sacral pressure (lateral decubitus position) – control without Sanyrene (R1)	57.2 ± 5.10
No sacral pressure (lateral decubitus position) – after Sanyrene application (R2)	58.5 ± 4.35
Sacral pressure (dorsal decubitus position) – control without Sanyrene (A1)	48 ± 5.99
Sacral pressure (dorsal decubitus position) – after Sanyrene application (A2)	53.7 ± 6.97

at risk of developing PI according to the EMINA Scale, who were admitted to hospital with an expected stay of at least seven days (Roca-Biosca et al, 2015). The patients were randomly assigned to receive the hospital's approved SoC for prevention of PI protocol (control group) or to receive Sanyrene application in addition to the same SoC as the control group.

By the end of the study period, the incidence of PIs were significantly reduced in the Sanyrene group (19%; 95% confidence interval [CI]: 12%–29%), compared with the control group (35%; 95%CI: 27%–14%; p=0.007).

Based on this clinical evidence, the authors recommended to include the use of Sanyrene in current SoC in order to ensure better quality of care, and to avoid preventable causes of suffering and the elevated costs subsequently associated with the treatment of PI.

Sanyrene and standard of care including silicone foam dressing versus standard of care including silicone foam dressing alone: a RCT in PI prevention (Huang et al, 2021)

The objective of this RCT was to investigate the effect of Sanyrene combined with a silicone multilayered foam dressing in prevention of PI in the perioperative period of spinal surgery. A total of 150 patients undergoing thoracolumbar surgery in prone position were randomly allocated to the control group (SoC that includes a silicone multilayered foam dressing) or experimental group (Sanyrene and SoC that includes a silicone multilayered foam dressing). Sanyrene was applied to various areas at high-risk of developing PI, such as forehead, zygoma, lower jaw, anterior superior spine and knee before the application of the foam dressing.

The results showed that the use of Sanyrene before the application of the multilayered foam dressing significantly reduced the incidence of PIs (7/75; 9.33% versus 18/75; 24.0%; p<0.05) compared with the control group. PIs of a higher category (category II) were also less prevalent in the Sanyrene group (14%) compared with the control group (17%). this also led to faster healing of the PIs that occurred in the Sanyerene group when compared with the control group (24 hours versus 24–72 hours). Finally, the patient satisfaction in the Sanyrene group was significantly better than in the control group (p<0.001).

Occurrence of perioperative PI not only affects the quality of care in the operating room, but more importantly increases the patient's pain and overall economic burden associated with the operation. If the postoperative recovery is poor or infection occurs, it can cause medical disputes and aggravate the doctor-patient relationship. Orthopaedics, spine surgery, neurosurgery and cardiothoracic surgery are usually the departments with the highest incidence of PI, due to long duration in prone position for the patients. Many clinical protocols exist to prevent PI, but no protocol that completely prevent the occurrence of perioperative PI has been found yet.

The use of Sanyrene before the application of multilayer foam dressings in posterior thoracolumbar spine surgery has been shown to effectively reduce the risk of perioperative PIs, reduce patient pain, improve patient satisfaction, and improve the quality of care in the operating room. According to the authors, this protocol is simple and easy to implement and can play a certain guiding role in how to prevent the occurrence of perioperative PI in the operating room.
The results of this RCT conducted in China confirmed the performance of Sanyrene, as demonstrated in the RCT conducted in 2005 in Spain, as well as demonstrating its benefits in different protocols for PI prevention. The authors declared no conflict of interest for this RCT that was conducted independently and without sponsorship.

The GIPPS study: a large prospective, observational study (Meaume et al, 2005)

To evaluate the clinical impact of the use of Sanyrene on PI incidence, a large prospective observational clinical study was conducted in 36 hospital geriatric departments in France. The centres included all patients who were hospitalised for at least two weeks and considered at 'high' or 'very high' risk of PIs according to the risk scale used in the department and the investigator's clinical assessment of the patient.

The main study criterion was the occurrence of new PIs during the course of a weekly medical follow-up. Secondary outcomes included the identification of risk factors for PIs.

This real-life prospective study included 1121 patients aged 84.7±8.1 years (median: 85 years). The analysis identified three subgroups of patients, depending on the local preventive treatment they received: no local treatment (40.4%), application of Sanyrene (34.5%) and application of diverse topical protective/emollient agents (protective pastes for incontinence, barrier creams and moisturisers

Box 1. Clinical testimonial — Jiahui Wang, Wound Center, The First Affiliated Hospital of China Medical University, Shenyang, China

I started using Sanyrene with our patients in 2016. Our patients are post-gastrointestinal cancer patients, and they are bed bound for at least three days after surgery. The first patient I used Sanyrene on had a category I pressure injury that resolved with Sanyrene in conjunction with off-loading. Since then, our department has been a regular user of Sanyrene, where, for at-risk patients Sanyrene is applied 4-5 times a day or every time we change patients' positions.

I believe that it should be used prophylactically for high-risk patients, such as elderly patients, patients who need to stay in bed after surgery, patients with malnutrition or urinary incontinence, etc., and. It is also better if it is administered as soon as possible. For patients who need to use Sanyrene during hospitalisation, the patient's family will be instructed on how to use it and how often at the time of admission. Sometimes we also apply Sanyrene under foam dressings as part of our pressure injury prevention protocol. In our experience we find that, for patients with category I pressure injury, within 30 minutes of application of the oil, there will be a reduction of the symptoms including reduction of the non-blanchable erythema, and even pain and numbness of the affected area.

When there is an incident of pressure injuries, this will not only aggravate the patient's condition, increase the workload of medical staff, but also increase the financial burden of the patient's family. Conversely, a low incidence of pressure injuries not only reduces the workload of nursing staff and has socio-economic benefits but also increases the trust of patients and their families in hospital care. We have included Sanyrene in our pressure injury prevention also as it is recommended in the Chinese Pressure Ulcer Care Guidance (2013 Edition), as a topical application for prevention of pressure injuries and of the worsening of category I pressure injuries, with a recommendation of grade B.

It is very meaningful for us as healthcare professionals, for the patients and their families, if pressure injuries can be effectively prevented. This can reduce the workload of nurses, and, more importantly, beneficial to patients and social economy.

25.1% of patients). The same proportions of patients at 'high risk' or at 'very high risk' of PIs were identified in these three sub-groups. In order to assess the impact of the different topical preventive strategies, a multifactorial analysis with logistic regression was performed, using the elements identified by univariate analysis to have a significant influence on PI development (multiple adjustments) as cofactors.

After two months of follow-up, PIs were reported in 15.7% (n=176) of this at-risk geriatric population. Sacral PIs were the most prevalent type of PI reported in 10.6% of the cohort. However, the incidence rates of sacral PI in high risk-patients varied greatly depending on the local preventive treatment the patients had received: from 16.3% and 15.6% for patients who received no local treatment group and patients who received topical emollient/protective agents, respectively to 7.3% for patients who received Sanyrene.

The results of the logistic regression analysis showed that only the use of Sanyrene significantly reduced the incidence of sacral PIs (p=0.04), with an odds ratio of 0.61 (95%CI: 0.38–0.95), indicating a reduction of 40% of the risk of developing a PI in all patients, regardless of their initial risk level.

Prevention of PIs induced by prolonged wearing of protective masks or goggles

Nurses working on the front lines of infectious disease prevention and control are required to wear medical protective masks and goggles, personal protective equipment (PPE), during shifts that can last up to 8 hours at a time. During this time, the prolonged use of PPE compresses the local skin, the slight slippage of the headbands eventually generates a frictional force, scrubbing the outer keratinised layer of the skin, while the low air permeability of the PPE, exhalation and perspiration contributes to the creation of a high degree of skin humidity, conducive to PI formation. In this context, the nose, forehead, and upper cheekbones areas become at high-risk for PIs because of their bony prominences and thin subcutaneous tissue. Thanks to their lubricant and occlusive properties, vegetable oils, such as Sanyrene, can reduce the frictional static and dynamic forces applied by PPE and hold the perspiration moisture from reaching the skin surface, thus contributing to reduce the risk of PPE-related PIs.

Sanyrene versus blank control in preventing skin lesions related to PPE: a RCT conducted during the COVID-19 pandemic (Song et al, 2020)

The efficacy of Sanyrene in the prevention of head and facial skin lesions related to PPE was explored in a pilot RCT conducted between January 2020 and February 2020 in a fever clinic in China. A total of 33 nurses wearing PPE (mask, goggle and shield) during 6-hour shifts were included in this trial and randomly allocated to the interventional group (n=16) where Sanyrene was applied, or to the control group (n=17) where no precautionary measures were taken. Sanyrene was applied twice a day, before and after wearing the facial PPE, on the cheeks, bridge of the nose, behind the ears and any other areas where the PPE would be in contact with the skin. Both groups were evaluated 4, 9 and 14 days after the implementation of the new procedure.

The results showed that the skin condition was significantly improved in the interventional group after 9 and 14 days of Sanyrene application, with notably less redness and less pain than in the control group (p<0.05).

The authors concluded that Sanyrene shows significant advantages in the early prevention of device-related facial PIs, in medical staff, resulting from wearing PPE. They go on to recommended it as part of a standard of care to prevent of such skin damage.

Sanyrene and hydrocolloid versus blank control in preventing nasal and facial PI related to PPE: a RCT conducted during the COVID-19 pandemic (Xia et al, 2020)

A similar RCT was conducted between January 2020 and March 2020 to explore the effect of Sanyrene combined with a hydrocolloid dressing (Algoplaque®, URGO Medical) for the prevention of PPE-related PI on nurses' nose and face.

A total of 97 nurses (24 to 45 years old) working in fever clinic, isolation ward and isolation intensive care unit were included in this trial. All participants wore medical protective masks, goggles and isolation protective equipment during 6-hour shifts and had at baseline intact nose and facial skin. The nurses were randomly allocated in two groups: the observation group received Sanyrene combined with Algoplaque for topical skin care, while the control group received routine skin care. Both groups wore PPE according to the standard requirements and ensured that the tightness of the headbands of medical protective masks and goggles was appropriate. The observation group sprayed Sanyrene on the areas easily compressed by PPE such as the nose, face and forehead, gently spread it out for one to two minutes, and let it dry. Then they cut the hydrocolloid dressing according to their facial contour and applied it to the nose, face and forehead, without tension, and replaced it once per shift. The nurses were followed-up for seven days. There was no statistically significant difference between the two groups, in terms of gender and age, and daily wearing time of PPE (on average 9 hours per day in each group: 9.4 ±1.4 and 9.3 ±1.6 hours in the observation and control groups, respectively). PI were defined and staged according to the 2016 National Pressure Ulcer Advisory Committee Guidelines (Edsberg et al 2016). The skin comfort was rated by the nurses using a 0–10cm visual analogue scale (0 being the most comfortable).

The results showed that the incidence of nasal and facial PI was significantly reduced in the observation group compared with the control group (18.75% versus 38.78%, respectively, $p<0.05$). The PIs that occurred in the observational group were also less severe than in the control group (category III: 0 versus 2; category II: 2 versus 11, respectively). The skin comfort was also significantly better in the observation group than in the control group (4.1 ±1.6 points versus 6.9 ± 1.3 points, respectively; $p<0.001$).

The authors concluded that topical application of Sanyrene, in combination with the use of Algoplaque can effectively reduce the incidence and severity of PI on the face of the nursing staff, while also improving the comfort and ensuring effective protection against device-related PIs.

Real-life survey on the use of Sanyrene in the prevention of PIs related to protective equipment during the COVID-19 pandemic (Moliner-Llopis et al, 2020)

During the COVID-19 pandemic, a high number of professionals were at risk of developing skin lesions secondary to the use of PPE. This national real-life survey, conducted in Spain during the recent 2020 COVID-19 pandemic aimed to assess the use of Sanyrene in the prevention of skin injury related to the wearing of protective devices (masks, glasses, protective gown with elastic cuffs, face shield, etc). A total of 134 healthcare professionals answered this survey. They included nurses and physicians from various settings (intensive care units, surgery units, care or recovery units, trauma units, oncology units, wound units, ambulatory care, etc), who used Sanyrene, alone or in association with other solutions, for the prevention of skin lesions during their work due to the long wear

Box 2. Clinician's testimonial – Trinh Xuan Quang, Head Nurse, Tien Giang Central General Hospital, My Tho City, Vietnam

Sanyrene has been available in Vietnam market for quite some time, and we have been aware of it since 2008. At that time, the product was still new and there was not much awareness about it. However, with the help of product education, it is now quite well used in our hospital. At that time, we had seminars, usage-sharing sessions, and user training on the application and benefits so that our nurses can make the best use of it according to the manufacturer's instructions.

Sanyrene is widely used in our high-risk wards such as Intensive Care Units, Stroke Units, and other critical care departments, where it is applied two to three times daily for those patients identified at risk of pressure injuries. Sanyrene has been present in the hospital and used regularly in the wards, but at present, due to the post-pandemic situation, there are many difficulties and limitations and sometimes products are out of stock. Due to this situation, the nurses suggest to the patients' family to acquire it from outside pharmacies. The relatives are happy to get the product for their loved ones as they are made aware of how important it is to prevent pressure injuries.

Sanyrene is a product that is simple to use and does not necessitate any special training. We advise the nurses to cleanse the high-risk area, thereafter, spray the oil on that area and then gently spread it on the skin area. Even when there is catergory I non-blanchable erythema, one day after the application the redness will disappear.

In terms of effectiveness, we think it is undeniable, because we find it very effective in the prevention of pressure injuries. Moreover, it is not just the clinicians that can apply it, but it is also easy to instruct relatives on how use it for their sick family member patients. We advise that we just need to use it at the right time, in the right way.

We find Sanyrene is a product that is simple, convenient, and with proven effectiveness. Also, the application is not time consuming, and it will save time, money, effort, and prevent patients' quality of life being reduced. We urge that Sanyrene should be included in the Ministry of Health recommendations list of products to also facilitate full reimbursement.

Box 3. Clinical testimonial — Shuangshuang Zhang, Nurse in-charge, The First Affiliated Hospital of Shandong First Medical University, Jinan, China

I took part in the entero-stomal therapists training program and become an ET nurse in 2015. I have heard of Sanyrene for the first time during the training program and learned how and when to use it. In 2016, when I began to work as an ET nurse in hospital, and I used Sanyrene for some of our patients. It is regularly applied for patients who are at risk of PIs or already have category 1 PI. We apply it twice daily, once in the morning and once in the night. What we have noticed is that it not only prevents PIs though its mode of action, but we also note that it may contribute to improve skin dryness and condition.

We know that PIs can be painful for patients, increase the burden of healthcare including for family, and can possibly lead to infection or even death. The incidence of PIs is also an important indicator of the quality of nursing care in the hospital.

In our hospital we understand that Sanyrene can limit the decrease in the $TcPo_2$ in tissue under pressure as seen in published evidence. Ischaemia and low oxygen due to occlusion of blood supply to a particular area is one reason PIs develop and therefore we understand that Sanyrene can be helpful in the prevention of PIs.

time of facial PPE. The time of application of Sanyrene by the healthcare professionals was:

- Just before the use of the protective device (masks or others): 34.3%
- Just after wearing the protective devices (masks or others): 58.2%
- At a distant time from the use of protective devices (masks or others): 7.5%.

Sanyrene was applied to different locations, but mostly on nasal bridge (92.5%), the forehead (68.7%), ears (53.7%), and cheeks (50.0%), and to a lesser extent on chin (19.4%), cuffs (5.2%) or other locations (9.0%). A quarter of the healthcare professionals (26.1%) use it associated with hydrocolloid, foam or silicone dressings.

According to the healthcare professionals reports on the specific use of Sanyrene the oil contributed to:

- An improvement of erythema and signs of irritation (73.1%)
- The prevention of PPE-related PIs (50%), with a reduction of the perceptible frictions during prolonged contact (38.8%)
- A better hydration of the skin (56.7%)
- An emollient effect on the skin (26.1%).

From an economic point of view, as only one spray of Sanyrene, applied twice a day, was enough to achieve these benefits, the authors concluded that the benefits of its use in the prevention of skin lesions related to the wearing of personal protective equipment was largely perceived and its use could be recommended in this indication to facilitate the daily work of healthcare professionals.

Prevention of radiodermatitis

Radiotherapy is an important method for the treatment of tumours, as it can effectively reduce the recurrence and distant metastasis rate of the primary tumour. Radiation dermatitis is one of the most common side effects of radiotherapy. Acute reactions may range from erythema, desquamation, sweating, oedema, to skin necrosis or ulceration of full-thickness dermis. These radiation skin reactions have been associated with pain and reduced QoL and may eventually lead to the interruption of radiotherapy and affect the treatment effect. To our knowledge, there are not yet established standards or clinical guidelines for the prevention of radiation dermatitis in China. In the past years, there have been more and more clinical trials conducted in China on the application of Sanyrene for this purpose, however a rigorous scientific evaluation of these studies was still expected.

Meta-analysis in radiodermatitis prevention (Siqing et al, 2022)

This study was conducted to assess the performance of Sanyrene in preventing radiodermatitis among patients with cancer after radiotherapy. The authors searched the China National Knowledge Infrastructure, SinoMed, WanFang Data, PubMed, Web of Science, EMBASE, and the Cochrane Library databases for RCTs published from inception to January 2021. The preliminary search identified 146 references. After removing duplicates, applying exclusion criteria, and screening titles and abstracts, 19 studies met the inclusion criteria. A standardised form was constructed to extract data from eligible studies. There were two reviewers who independently screened the literature, extracted data and assessed the risk of bias of the included studies. The authors used the Cochrane risk-of-bias tool to assess the risk of bias for each study.

The 19 RCTs identified were published between 2008 and 2020 (the three most recent in 2020, showing a current, strong interest in the prevention of radiodermatitis) and included 1,508 patients who underwent radiotherapy for various types of cancer.There were 10 studies that involved patients with head and neck cancer, three studies with thoracic neoplasms, four studies with abdominal pelvic tumours, one study with head and neck and chest tumours, one study with perineal cancer, and one study that included all tumours. Some variations in the Sanyrene protocol were noted in the different RCTs, in terms of timing and number of applications. The different control group consisted of blank control or the application

Box 4. Clinician's testimonial – Dang Van Thach, Head of Nurse, Department of Anesthesia and Resuscitation Surgery, Tien Giang Central General Hospital, My Tho City, Vietnam

I became aware of Sanyrene mainly through seminars and in-house training. I have been using Sanyrene on my patients for 5 years now. We use it two to three times daily for patients presenting with Grade 1 pressure ulcers and for patients at high risk, such as, comatose patients, immobile or with limited mobility.

Sanyrene is used a lot for patients presenting with grade 1 ulcers, comatose patients, immobile or limited mobility patients. It is used as part of a standard of care including nutrition, change of position to offload and avoiding moisture. In our experience, even Stage 1 pressure ulcers improve just after one day of application.

Currently, the nursing department is implementing a project to assess the risk of pressure ulcers through the Braden scale. From there, prevention can be based on the patient's level of ulcer risk, where Sanyrene can be used for high and moderate ulcer risk patients.

We believe in the effectiveness of Sanyrene both because of the robust evidence behind it and also from our positive experience. Furthermore, it is not time consuming and very easy to apply for in-patients, and relatives of patients can easily be taught to continue usage.

of topical product such as trolamine cream or medical radiation protection spray. The RCTs were at low or unclear risk of bias, and funnel plots revealed no evidence of publication bias for the examined outcomes.

The results showed that Sanyrene significantly decreases the total incidence of radiodermatitis (odds ratio [OR]: 5.00; 95% CI: 2.77–9.03; $p<0.00001$), as well as the incidence of radiodermatitis grade 2 (OR: 0.55; 95% CI; 0.36–0.85; $p=0.007$), grade 3 (OR: 0.22; 95% CI, 0.09–0.57; $p=0.002$), and grade 4 (OR: 0.32; 95% CI, 0.13–0.78; $p=0.01$). In addition, in comparison with controls, Sanyrene improves the cure rate (OR: 8.18; 95% CI: 4.03–16.60; $p<0.00001$) and delays the time to onset of radiodermatitis (mean difference: 3.69; 95% CI: 3.03–4.36; $p<0.00001$).

The authors concluded that 'the available evidence suggests that Sanyrene is significantly more effective than conventional care in preventing radiodermatitis, helping to reduce the incidence of radiodermatitis in patients receiving radiotherapy, especially in grade 2 or higher radiodermatitis, helping to improve the cure rate of radiodermatitis, and outperforming the conventional care group in prolonging the appearance of radiodermatitis. Sanyrene in the prevention of radiodermatitis still needs to be validated in large, prospective, high-quality studies in terms of improving patients' QoL and radiotherapy completion rates'.

Boxes 1–5 show a series of testimonials from health professionals who have worked with Sanyrene.

Box 5. Clinician's testimonial – Kavitha Sanmugam, Advanced Practice Nurse (Wound Care Nurse), St. Luke's Hospital, Singapore

Since we started to use Sanyrene we have observed its benefits in the prevention of pressure injuries. I do believe that it should be included in protocols and guidelines as part of the routine of pressure injury prevention management. It must be a preemptive treatment to be included in the local practices so that the nurses can follow it accurately. Prevention is better than cure. If the patients were to develop pressure injury wounds, the nurse must spend more time doing wound dressing changes etc., and her workload increases. If the nurses can prevent the incidence of pressure injuries, then it benefits both parties: both the patients and the nurses.

We find it very easy to apply. It comes in a small, handy bottle, and you just spray a little on your fingers and then rub spread the oil gently on the areas of the bony prominences. And it is also quite easy to teach how to apply Sanyrene to our junior nurses. If we do have cases of patients who develop non-blanchable erythema, the nurses immediately apply Sanyrene. They do see the benefits of using it and have a good experience with the positive results. We highly appreciate Sanyrene as it also helps improving the quality of life of our patients.

Conclusion

Many strategies have been implemented for the prevention of PIs. The evidence reported here shows that Sanyrene, in combination with an evidence-based standard of care, can be very effective in reducing PI incidence. The evidence suggests consistent benefits in terms of reduction of PIs and improvement of the patient's QoL. Our testimonials further substantiate this by sharing real-life experience in alleviating the burden of PIs through a simple and easy-to-implement procedure. WAS

Declaration of interest

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