NICE advice

LQD Spray for treating acute and chronic wounds

Medtech innovation briefing
Published: 17 December 2019

www.nice.org.uk/guidance/mib202

Summary

- The **technology** described in this briefing is LQD Spray. It is for the external, local treatment of a range of acute and chronic wounds. This includes chronic leg ulcers, superficial partial thickness burns and self-harm wounds.
- The **innovative aspects** are that it is the only biopolymer wound dressing, and can be used without a secondary dressing (unless it is clinically indicated). Also, it is a natural antimicrobial and it can be used in patient self-management, although there is no published evidence on this use.
- The intended **place in therapy** would be instead of or in addition to other primary wound dressing options, such as foam dressings, film dressings or hydrofibre dressings for people with acute and chronic wounds. It could replace secondary wound dressings for some patients.

- The **main points from the evidence** summarised in this briefing are from 4 observational studies including 222 patients in primary and secondary care in the UK and Germany. They show that LQD Spray could reduce wound size and pain in patients with acute and chronic wounds.
- **Key uncertainties** around the evidence or technology are that evidence is limited in both quality and quantity, with small sample sizes and no comparator groups. There is also a limited evidence for certain indicated patient populations, such as patients with self-harm wounds.
- The **cost** of LQD Spray is £45.00 per unit (exclusive of VAT). The **resource impact** is usually in addition to standard care. However, this could be offset if there are greater benefits, such as no need for a secondary dressing and reduced nursing time.

The technology

LQD Spray (Brancaster Pharma) is a spray-on primary wound dressing. It contains a modified biopolymer chitosan (chitosan FH02). The chitosan FH02 electrostatically interacts with cell surfaces and other biomolecules. The company states that the chitosan in LQD Spray comes from the shell of the Norwegian arctic sea shrimp, which is processed for medicinal use. The company claims it can replace the need for a secondary dressing in some patients, reduce pain and improve wound healing. This is because the properties of chitosan:

- help to slow bleeding
- enhance inflammatory cell function
- promote formation of new blood vessels and connective tissue
- are antimicrobial and antifungal
- strengthen repaired tissue.

After cleaning or debriding the wound as needed, the company recommends that LQD Spray is sprayed over the wound from 10 cm away. It forms an active, chitosan-containing membrane over the wound within 2 minutes. The transparent, elastic film acts as a primary dressing and is a physical protection over the wound's surface. LQD Spray can be removed by cleaning the wound, or it is removed naturally through skin renewal. A secondary dressing and compression can be put over the wound after LQD Spray if clinically

appropriate. For example, to manage low to moderate levels of exudate, to provide protection and padding to a burn wound, or in patients with chronic leg ulcers when compression bandaging is put over the wound after LQD Spray.

Innovations

LQD Spray is the only biopolymer wound dressing and it does not always need a secondary dressing. It is a natural antimicrobial which the company claims may reduce organism numbers of common wound pathogens, and it can be used in patient self-management. The company also states that it is innovative because it has a benefit at every stage of the wound healing process.

Population, setting and intended user

LQD Spray is for patients with acute wounds, including patients with self-harm wounds and chronic wounds. In patients with acute wounds, LQD Spray is for use instead of other primary wound dressing options. In patients with chronic wounds such as chronic leg ulcers, LQD Spray is for patients with wounds that are not healing with standard wound dressings such as foam dressings, super absorbers, alginate dressings and hydrofibre products. It is likely to be used in primary and secondary care. The company also claims that LQD Spray increases self-management, suggesting that it could be used by patients at home.

LQD Spray is likely to be used by tissue viability nurses, district nurses, podiatrists and patients themselves. The company states that no training is needed.

The company advises that LQD Spray is not appropriate for heavily exuding wounds, and heavy fibrin coatings and necrotic tissues must be debrided before treatment. LQD Spray is not fully effective if used with hydrogels or hydrocolloid dressings. The company states that there is no information available about LQD Spray use in pregnant women or nursing mothers. An additional caution outlined by the company is that LQD Spray may contain shellfish allergens. Inhalation and ingestion of LQD Spray should always be avoided. Special caution is recommended for any user who has a history of shellfish allergy, including those applying the treatment or in immediate vicinity of the spray.

Current care pathway

The current standard of care depends on aetiology. NICE's guideline on self-harm in over 8s recommends treating superficial uncomplicated injuries of 5 cm or less in length with tissue adhesive as first-line treatment. Skin closure strips may be offered if patients prefer. When treating superficial uncomplicated injuries of greater than 5 cm in length, or deeper injuries of any length, NICE recommends wound assessment and exploration, with a full discussion to decide the appropriate physical treatment. For patients who have a history of self-harm, NICE recommends that clinicians offer advice and instructions for the self-management of superficial injuries, including the provision of tissue adhesive.

For patients with diabetic foot ulcers, NICE's guideline on diabetic foot problems recommends 1 or more of the following treatment options: offloading, control of foot infection, control of ischaemia, wound debridement and wound dressings. NICE recommends that clinical assessment of the wound should be considered when deciding on wound dressings and offloading, as well as the person's preference. Devices and dressings with the lowest acquisition cost appropriate to the clinical circumstances should be used. NICE's medical technologies guidance on UrgoStart for treating diabetic foot ulcers and leg ulcers recommends interactive UrgoStart dressings to treat diabetic foot ulcers and venous leg ulcers when modifiable factors have been treated.

NICE's guideline on pressure ulcers recommends a wound dressing taking into account the patient's pain and tolerance, position of ulcer, amount of exudate and frequency of dressing change. For category 2, 3 and 4 pressure ulcers, a dressing should be considered that promotes a warm and moist wound healing environment. Gauze dressings are not recommended. Debridement may be needed depending on the amount of necrotic tissue, characteristics of ulcer, patient tolerance and comorbidities.

The Scottish Intercollegiate Guidelines Network's (SIGN's) management of chronic venous leg ulcers guideline recommends simple non-adherent dressings in addition to high-compression multicomponent bandaging for patients with chronic venous leg ulcers. Pentoxifylline may also improve healing for these patients.

Costs

Technology costs

LQD Spray has been listed in the NHS electronic drug tariff since May 2019. LQD Spray costs £45.00 (for 12 ml: 120 sprays per bottle). Costs per wound vary according to the indication and are summarised in table 1. All costs are company estimates. The costs assume no wastage of the spray. The costs of LQD Spray are as well as any secondary dressing that may be needed. The company states that after opening, LQD Spray can be stored upright at room temperature (15°C to 25°C) with its protective cap. It has a shelf life of 6 months after opening. The company says that, once open, the bottle can be used on multiple patients or multiple times for the same patient.

Table 1 Costs of LQD Spray according to indication

Description	Cost	Additional information
Acute wounds	£0.75 to £1.50 per application £1.50 to £4.50 per week £3.00 to £9.00 over 2 weeks	Average wound needs dressing 2 to 3 times per week, with 2 to 4 sprays per application. Company says average wound healed within 2 weeks.
Acute self-harm wounds	£0.75 per application £2.25 per week	Average wound needs dressing 3 times per week, with 2 sprays per application. These cost estimates assume 1 small wound only. Patients with self-harm wounds may have multiple wounds, meaning costs may be higher.
Chronic wounds, for example, leg ulcers	£0.75 to £1.13 per application £3.75 per week £45 over 12 weeks	2 to 3 sprays per application.

Costs of standard care

A range of dressings can be used for acute and chronic wounds. Possible options are in table 2.

Table 2 Costs of standard wound dressings

Description	Cost per dressing	Additional information
Sterile, non-sterile and absorbent dressings	£0.07 to £2.60	Price depends on size and type. Source: NHS electronic drug tariff (August 2019).
Hydrogel dressings	£1.41 to £32.10	Price depends on size, type (gel versus ointment versus powder) and quantity. Source: NHS electronic drug tariff (August 2019).
Biocellulose dressings	£2.10 to £11.93	Price depends on size and type of biocellulose dressing. Source: NHS electronic drug tariff (August 2019).
Alginate dressings with superabsorbent backing	£1.77 to £9.15	Price depends on size and type of alginate dressing. Source: NHS electronic drug tariff (August 2019).
UrgoStart dressings	£4.28	Source: NICE medical technologies guidance on UrgoStart (accessed August 2019).

Resource consequences

The company states that LQD Spray is new to the NHS. The resource impact is in addition to standard care, but could be offset if there are greater benefits, such as no need for a secondary dressing and reduced nursing time.

Regulatory information

LQD Spray is a CE-marked class III medical device.

There is a Medicines and Healthcare products Regulatory Agency urgent field safety notice for LQD Spray. This details a single case report when accidental inhalation of LQD Spray may have caused a severe allergic reaction in a person with a known allergy to shellfish. A safety warning has been issued that inhalation or ingestion of the spray should always be avoided. Special caution is recommended in any user with a history or suspicion of shellfish allergy, including those applying, or in the immediate vicinity of, the treatment being applied. So far, this is the only case report of an allergic reaction in connection with LQD Spray that the manufacturer is aware of.

Equality considerations

NICE is committed to promoting equality of opportunity, eliminating unlawful discrimination and fostering good relations between people with particular protected characteristics and others.

Older people, people with diabetes and those with restricted mobility are more likely to have chronic or non-healing wounds. Age and disability are protected characteristics under the Equality Act 2010.

Clinical and technical evidence

A literature search was carried out for this briefing in accordance with the interim process and methods statement. This briefing includes the most relevant or best available published evidence relating to the clinical effectiveness of the technology. Further information about how the evidence for this briefing was selected is available on request by contacting mibs@nice.org.uk.

Published evidence

There are 4 observational studies summarised in this briefing, involving 222 patients who used LQD Spray. Included studies were done in the UK and Germany. Two of the included studies used LQD Spray in slow or non-healing diabetic and venous ulcers. Another study

used LQD Spray mainly in chronic wounds, but also included patients with post-operative wounds and burns. The most recent study included LQD Spray in patients with wounds secondary to self-harm. Outcomes were assessed by clinicians, but the exact settings (primary or secondary care) are not clearly documented.

Table 3 summarises the clinical evidence as well as its strengths and limitations.

Overall assessment of the evidence

The evidence for LQD Spray is limited in quality and quantity. Studies lack a comparator group, which makes it difficult to draw conclusions on the efficacy of LQD Spray compared with standard care. There is also limited evidence in patients with self-harm wounds.

Larger, UK-based multicentre randomised controlled trials comparing LQD Spray with standard of care should be done. These should include patients with chronic wounds, such as diabetic foot ulcers and venous leg ulcers, and patients with acute wounds, such as self-harm wounds. Follow up should be long enough to show wound healing or change in treatment regime if LQD Spray is not successful. Studies should use LQD Spray in a variety of settings, including primary care, secondary care (both inpatient and outpatient) and home settings. Blinding of clinicians may not be possible because of visual differences between LQD Spray and standard care.

Table 3 Summary of selected studies

Sharpe et al. (2018)	
Study size, design and location	A multicentre observational study involving 35 patients with non-healing or slow-healing diabetic foot ulcers (n=11) or venous leg ulcers (n=24). Location: UK.
Intervention and comparator(s)	Intervention: LQD Spray (n=35). No comparator.

Key outcomes	In the venous leg ulcer patients, 13 healed completely, 11 showed a 75% wound area reduction and an increase in the percentage of healthy tissue. In diabetic foot ulcer patients, 5 patients healed, 4 patients made progress towards healing and 2 patients showed no change. No patients reported any clinical signs or symptoms of infection or biofilm formation. Patient and clinician reporting indicated LQD Spray had a 'positive impact' on wound progress. Costs calculated showed LQD Spray saved £3,771.75 and £1,492.19 in diabetic foot ulcer and venous leg ulcer groups respectively. The average treatment time saved was 117 days for diabetic foot ulcers.
Strengths and limitations	Study was based in UK so generalisable to NHS setting. The multicentre design at 4 clinical locations and use of the same clinical wound evaluation form increases reliability of results. No comparator so unable to compare results with standard care. LQD Spray was added to existing treatment regimens, so it is not possible to attribute wound healing solely to LQD Spray. Clinicians and patients were not blinded, introducing the risk of bias. There were 3 patients lost to follow up, but these patients were not accounted for and reasons for loss to follow up were not documented.
Hampton (2018)	
Study size, design and location	An observational study involving 7 patients with slow-healing venous leg ulcers. Location: UK.
Intervention and comparator(s)	Intervention: LQD Spray. No comparator.
Key outcomes	Out of 7 patients, 4 patients' wounds healed (57%), with the remaining 3 patients showing reduced wound surface area. There were 7 patients with reduced frequency of dressing changes, from 2 to 1 dressing change per week in 6 patients and from 3 to 1 in the other patient. There were 6 patients who had an improvement in tissue type present in the wound, and 1 patient noted an increase in sloughy tissue. The calculated cost savings with LQD Spray were £3,535.

Strengths and limitations	Very small sample size limits reliability of results. The LQD Spray was used in addition to a pre-existing dressing regimen, making it difficult to attribute any healing solely to LQD Spray. Patient-reported outcomes are subject to bias and are subjective. Lack of statistical analysis of results. No comparator group makes it difficult to draw conclusions to standard care. Baseline characteristics not similar, so confounding factors not well controlled, for example, there was a large range of patient ages (17 to 88 years) and wound sizes (2.5 × 2 × 5 cm^2 to 6.1 × 6.1 × 37.21 cm^2).
Widler et al. (2014)	
Study size, design and location	A multicentre cohort study involving 173 patients with venous ulcers, diabetic foot syndrome, decubitus and other chronic wounds, post-operative disorders, burns and abscesses, and other indications from 15 medical practices and wound centres. Location: Germany.
Intervention and comparator(s)	Intervention: LQD Spray. No comparator.
Key outcomes	There were 173 patients (100%) who showed improvement in wound status, with 13 patients having complete healing. Pain decreased more than 90% with LQD Spray. Practitioners were 'satisfied' with LQD in 145 patients (83.8%), not satisfied in 15 patients (9.7%) and data were not available for 13 patients (7.5%). Wound size was evaluated in 171 patients, and decreased or became stable with LQD Spray in more than 94% of patients.
Strengths and limitations	Good sample size and multicentre study increases reliability of results. Range of outcomes considered including pain, wound size and healing. Unpublished, not a peer-reviewed study from company website, so is considered low-quality evidence. Study in Germany so may not be applicable to NHS setting. No statistical analysis of results. No comparator so unable to draw conclusions compared with standard care. Subjective reporting of practitioner satisfaction in addition to lack of blinding introduces risk of bias.
Hinchliffe and Linthwaite (2019)	

Study size, design and location	A 2-centre evaluation involving 7 patients with wounds secondary to self-harm (n=3), neglect (n=2) and diabetes (n=2). Location: UK.
Intervention and comparator(s)	Intervention: LQD Spray. No comparator.
Key outcomes	All wounds healed within 3 weeks. The surrounding skin after LQD Spray was 'healthy' in 5 patients, and 'healed' in 2 patients. No wounds had any exudate following LQD Spray.
Strengths and limitations	Non-comparative study is low-quality evidence. Very small sample size limits reliability of results. No statistical analysis of results. No information on how skin healing was assessed, and whether this was consistent across the 2 sites.

Recent and ongoing studies

Ongoing research has been identified by the company, including in NHS hospitals and community settings in the UK. Therapy areas of research include patients with dementia, patients with ulcers, stoma sites, and burns.

Specialist commentator comments

Comments on this technology were invited from clinical specialists working in the field. The comments received are individual opinions and do not represent NICE's view.

All 3 specialists were familiar with or had used this technology before.

Level of innovation

All commentators classed LQD Spray as innovative. Commentators thought that the device could help with patient self-care and shared care because of ease of use. No commentators were able to identify a competing wound spray containing chitosan. However, 1 commentator highlighted that there are existing chitosan dressings, but was uncertain if the formation of chitosan was the same as that in LQD Spray. A different commentator identified an available antimicrobial spray, but this differs from LQD Spray

because it is oil-based and always needs a secondary dressing.

Potential patient impact

Potential patient benefits identified by commentators included increased patient self-care resulting in empowerment, improved shared care, and reduced reliance on healthcare professionals. Commentators also cited benefits of improved wound healing, a reduced need for a secondary dressing, which could result in less skin irritation or breakdown, and ease of use.

Commentators thought that groups of people who could particularly benefit from LQD Spray included: children, people with multiple dressing sensitivities, chronic wounds, and people when a dressing is not tolerated (such as those who self-harm, people with learning disabilities, autism and sensory difficulties, dementia or burn wounds). One commentator highlighted that the haemostatic properties of LQD Spray could stop bleeding in highly vascularised areas such as the scalp.

Commentators agreed that LQD Spray could change clinical outcomes, and reduce the time associated with patient appointments at GPs, clinics or district nurse home visits. One commentator thought that it may decrease antibiotics because of the antimicrobial properties of the technology. The same commentator thought that clinicians could develop new pathways for high-risk wounds so that LQD Spray could be used first line, for example, in immunocompromised patients.

Potential system impact

Potential system benefits identified by commentators included reduced nurse time if a secondary dressing was not needed, and reduced number of applications because it does not need to be applied daily.

Opinions on the cost of LQD Spray varied. One commentator thought that LQD Spray would cost less if no secondary dressing was needed, but if a secondary dressing was needed, it would cost the same as standard care. Two commentators agreed that there would be fewer costs associated with healthcare demands (fewer secondary dressings), delivery (fewer nurse visits) and specialist care.

All commentators identified potential reduced resource impact with LQD Spray.

Commentators highlighted ease of use (it does not need a registered nurse to apply and so can be applied by other team members in wards and care homes) and transferability between care settings, reducing delays in transfers or discharges. Two other commentators identified fewer dressing changes and so less wastage, and fewer community nurse visits and potential for hospital admission avoidance.

One commentator stated that training needed would be basic initial knowledge from a company representative.

General comments

Two commentators were unable to estimate the eligible number of patients. One commentator estimated that 60% to 80% of patients with wounds would be eligible for LQD Spray. The place of LQD Spray in the care pathway was thought to be in addition to standard care or replacing standard care, for example, replacing a dressing that contains chitosan. One commentator highlighted a possible issue with LQD Spray being the time taken for the spray to dry.

Adoption concerns include the need for further evidence. Commentators identified further evidence needed in certain subgroups of patients, for example, those who self-harm. A separate commentator agreed that clinical experience and clinical evidence on LQD Spray is limited.

Specialist commentators

The following clinicians contributed to this briefing:

- Joy Tickle, tissue viability specialist, Shropshire Community NHS Trust, did not declare any interests.
- Julie Sturges, lead nurse tissue viability, Buckinghamshire Healthcare NHS Trust, did not declare any interests.
- Anita Kilroy-Findley, clinical lead tissue viability, Leicestershire Partnership NHS Trust. Declared indirect financial interests because she delivered a lecture on 4 occasions as part of Journal of Community Nursing conferences, with the speaker fee and travel paid for by the company.

Development of this briefing

This briefing was developed by NICE. The interim process and methods statement sets out the process NICE uses to select topics, and how the briefings are developed, quality-assured and approved for publication.

ISBN: 978-1-4731-3621-2