



# Wound exudate and the role of dressings

## **A consensus document**



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## FOREWORD

The principles of exudate management presented in this document represent the consensus opinion of an international panel of experts. Many of these experts participated in a group meeting in 2006. A lack of evidence and guidance in the field and the technical complexity of dressings were discussed. The discussions highlighted the need for a document with a practical focus that describes what exudate is, what exudate tells us and how to assess and manage exudate.

The content is aimed at all healthcare professionals involved in wound management, and is designed to be adaptable for local use in countries worldwide. Ultimately, it is anticipated that the recommendations will help to improve clinical outcomes, enhance patients' quality of life and aid resource allocation.

**Professor Keith Harding**



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# PRINCIPLES OF BEST PRACTICE

Clinicians have described wound exudate as ‘what is coming out of the wound’, ‘wound fluid’, ‘wound drainage’ and ‘an excess of normal fluid’. Existing definitions of wound exudate fail to capture its true complexity. What is currently known is that wound exudate is produced in response to a complicated interaction between:

- wound aetiology
- wound healing physiology
- wound environment
- compounding pathological processes.

Wound exudate is often misconceived as ‘bad’. In fact, **exudate is known to assist healing** by:

- preventing the wound bed from drying out
- aiding the migration of tissue-repairing cells
- providing essential nutrients for cell metabolism
- enabling the diffusion of immune and growth factors
- assisting separation of dead or damaged tissue (autolysis).

However, exudate may become a problem for the patient/caregiver when the quantity produced and/or its composition delay or prevent wound healing, cause physical and psychosocial morbidity and/or increase demand on healthcare resources.



**Wound exudate is not just an inert fluid – understanding its components and causes will help to improve care**

## CHALLENGING MYTHS

### ‘All exudate is bad’

Although the quantity or composition of exudate may be harmful or delay healing, the theory of moist wound healing emphasises the important role of wound fluid in assisting healing.

### ‘All increased exudate relates to increased bacterial load or overt infection’

Increased exudate has a wide range of underlying causes. These should be identified and addressed as part of the management plan.

### ‘A dirty dressing is a useless dressing’

Soiled dressings provide useful information about exudate and the suitability of the dressing for the wound. They can help to inform wound management and dressing selection.

### ‘All you need is the right dressing to solve problems associated with exudate’

Dressing selection is an important aspect of exudate management. However, treating contributory or underlying factors and modifying the wound environment are also vital.

### ‘All you need is more padding’

Good management of exudate requires reassessment of the patient and the management plan when strikethrough or leakage continue or worsen.



## APPLICATION TO PRACTICE

**Exudate needs to be managed to maximise its benefits to the wound and the patient**  
**Exudate – understand it, assess it, manage it!**

# WHAT IS EXUDATE?

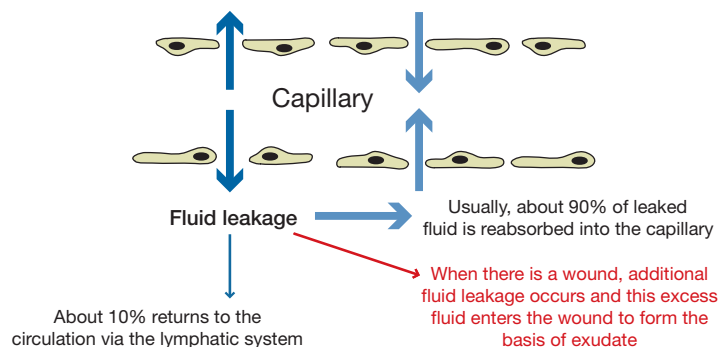
## PRODUCTION OF EXUDATE

Exudate is derived from fluid that has leaked out of blood vessels and closely resembles blood plasma. Fluid leaks from capillaries into body tissues at a rate that is determined by the leakiness (permeability) of the capillaries and the pressures (hydrostatic and osmotic) across the capillary walls. The relationship between the factors that determine how much fluid leaks out is known as **Starling's hypothesis**. In general, most (about 90%) of the leaked fluid is reabsorbed into capillaries. The small amount that is not reabsorbed (about 10%) is returned to the central circulation via the lymphatic system. As a result, in the steady state, leakage from capillaries is balanced by the reabsorption and drainage of fluid.

In a wound, the initial injury initiates inflammation, an early stage of the healing process. Mediators involved in inflammation, eg histamine, increase capillary permeability so that white blood cells can escape and the blood vessels leak more fluid. **The excess fluid enters the wound where it forms the basis of exudate** (Figure 1).

In a healing wound, exudate production generally reduces over time. In a wound that is not healing as expected, exudate production may continue and be excessive due to ongoing inflammatory or other processes. **Although a moist environment is necessary for optimal wound healing, conditions of extreme wetness or dryness may adversely affect healing.**

**Figure 1 | Mechanisms underlying exudate production**



## COMPOSITION OF EXUDATE

Exudate contains a variety of substances including water, electrolytes, nutrients, inflammatory mediators, white cells, protein-digesting enzymes (eg matrix metalloproteinases – MMPs), growth factors and waste products.

In the **healing wound**, exudate appears to promote healing in a number of ways, including stimulating cell proliferation. MMPs, which break down the cell-supporting extracellular matrix, are present mainly in an inactive form. In **wounds not healing as expected** (chronic wounds), exudate appears to have opposite effects. This exudate contains elevated levels of inflammatory mediators and activated MMPs.

Further research is needed to clarify the role of exudate, particularly in delayed healing. This may broaden understanding and help to develop novel approaches to care.



## APPLICATION TO PRACTICE

**An important aim of management is to minimise the detrimental effects and maximise the positive effects of exudate**

# WHAT EXUDATE TELLS US

1. Thomas S, Fear M, Humphreys J, et al. The effect of dressings on the production of exudate from venous leg ulcers. *Wounds* 1996; 8(5): 145-50.

In addition to the wound itself, exudate is influenced by a wide range of local, systemic and practical factors. Traditionally, information about exudate is gained from examination of **colour, consistency, odour and amount** (Figures 2 and 3). These characteristics may indicate components, contaminants or underlying cause (Tables 1 and 2).

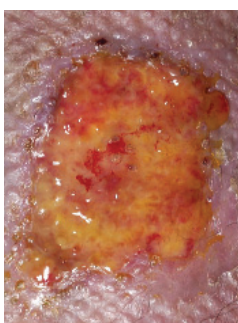
The **amount of exudate** produced by a wound is partly dependent on surface area. Consequently, the larger the surface area, the greater the likely volume of exudate. Some wound types are perceived to have high rates of exudate production, eg burns, venous leg ulcers, skin donor sites and inflammatory ulcers (eg rheumatoid and pyoderma gangrenosum). However, these are often large wounds and so would be expected to produce higher volumes of exudate<sup>1</sup>.



**An unexpected change in exudate characteristics may indicate a change in wound status or concomitant disease process and should prompt re-evaluation**



**Figure 2 |** Mainly clear, serous, thin exudate with granulation tissue visible in the wound bed



**Figure 3 |** Thick haemopurulent exudate

Photos copyright of the Cardiff and Vale NHS Trust – Professor Keith Harding

**Table 1 |** Colour, consistency and odour of exudate

Significance of exudate colour*	
Characteristic	Possible cause
Clear, amber	■ Serous exudate, often considered 'normal', but may be associated with infection by fibrinolysin-producing bacteria such as <i>Staphylococcus aureus</i> ; may also be due to fluid from a urinary or lymphatic fistula
Cloudy, milky or creamy	■ May indicate the presence of fibrin strands ( <b>fibrinous exudate</b> – a response to inflammation) or infection ( <b>purulent exudate</b> containing white blood cells and bacteria)
Pink or red	■ Due to the presence of red blood cells and indicating capillary damage ( <b>sanguineous</b> or <b>haemorrhagic exudate</b> )
Green	■ May be indicative of bacterial infection, eg <i>Pseudomonas aeruginosa</i>
Yellow or brown	■ May be due to the presence of wound slough or material from an enteric or urinary fistula
Grey or blue	■ May be related to the use of silver-containing dressings

\*NB Some medications are known to discolour urine and consideration could be given to drugs as a cause of exudate discolouration when all other causes have been excluded

Significance of exudate consistency	
Characteristic	Possible cause
High viscosity (thick, sometimes sticky)	■ High protein content due to: – infection – inflammatory process ■ Necrotic material ■ Enteric fistula ■ Residue from some types of dressings or topical preparations
Low viscosity (thin, 'runny')	■ Low protein content due to: – venous or congestive cardiac disease – malnutrition ■ Urinary, lymphatic or joint space fistula

Significance of exudate odour**	
Characteristic	Possible cause
Unpleasant	■ Bacterial growth or infection ■ Necrotic tissue ■ Sinus/enteric or urinary fistula

\*\*NB Some dressings, eg hydrocolloids, may produce a characteristic odour

### Significance of high exudate production

In addition to the size of the wound, high levels of or an increase in exudate production may be indicative of underlying disease processes, such as infection or other factors (Table 2). High exudate production may have a wide variety of causes. For example, increased exudate production in a patient with a chronic venous leg ulcer may be due to:

- wound inflammation/infection
- longer periods spent with legs in a dependent position
- reduced willingness or ability to cooperate with compression therapy
- development or deterioration of congestive cardiac failure and peripheral oedema.

Diagnosing infection or any other underlying disease process relies on full assessment and investigation. Increased exudate production alone is insufficient evidence for a diagnosis.

### Significance of low exudate production

Low exudate production may be a feature of ischaemic ulcers or indicative of a systemic problem such as dehydration.



### APPLICATION TO PRACTICE

**Modification, where possible, of causative and contributory factors forms an important part of exudate management**

**Table 2 | Factors that may influence exudate production**

Factor	Effect on amount of exudate	
	Increased	Decreased
Wound healing stage	<ul style="list-style-type: none"> <li>■ Inflammatory stage of normal wound healing</li> <li>■ Wounds that are not healing as expected (chronic wounds; sustained inflammatory phase)</li> <li>■ Autolytic debridement and liquefaction of necrotic tissue</li> </ul>	<ul style="list-style-type: none"> <li>■ Towards the end of the healing process (ie during proliferation/maturation)</li> <li>■ Wounds with dry eschar</li> </ul>
Local factors	<ul style="list-style-type: none"> <li>■ Local infection/inflammation/trauma (eg surgical debridement)</li> <li>■ Foreign body</li> <li>■ Oedema (eg venous insufficiency/inferior or superior vena caval obstruction/venolymphatic dysfunction/lymphoedema)</li> <li>■ Sinus or urinary, enteric, lymphatic or joint space fistula</li> </ul>	<ul style="list-style-type: none"> <li>■ Ischaemia</li> </ul>
Systemic factors	<ul style="list-style-type: none"> <li>■ Congestive cardiac, renal or hepatic failure</li> <li>■ Infection/inflammation</li> <li>■ Endocrine disease</li> <li>■ Medication (eg calcium channel blockers, non-steroidal anti-inflammatory drugs (NSAIDs), steroids, glitazones)</li> <li>■ Obesity/malnutrition</li> </ul>	<ul style="list-style-type: none"> <li>■ Dehydration</li> <li>■ Hypovolaemic shock</li> <li>■ Microangiopathy</li> </ul>
Practical factors	<ul style="list-style-type: none"> <li>■ Wound position, eg lower limbs and over pressure areas</li> <li>■ Heat</li> <li>■ Reduced willingness or ability to cooperate with pharmacological (eg diuretic) or non-pharmacological (eg compression) treatment</li> <li>■ Inappropriate dressing use/intervention</li> </ul>	<ul style="list-style-type: none"> <li>■ Inappropriate dressing use/intervention</li> </ul>



**Any factor that increases capillary leakage or predisposes to the development of tissue oedema may boost exudate production**

# ASSESSMENT OF EXUDATE

2. Stotts NA, Rodeheaver GT, Thomas DR, et al. An instrument to measure healing in pressure ulcers: development and validation of the pressure ulcer scale for healing (PUSH). *J Gerontol A Biol Sci Med Sci* 2001; 56(12): M795-99.
3. Bates-Jensen BM. The Pressure Sore Status Tool a few thousand assessments later. *Adv Wound Care* 1997; 10(5): 65-73.
4. Falanga V. Classifications for wound bed preparation and stimulation of chronic wounds. *Wound Repair Regen* 2000; 8(5): 347-52.
5. Browne N, Grocott P, Cowley S, et al. The TELER system in wound care research and post market surveillance. *EWMA Journal* 2004; 4(1): 26-32.

Exudate is often regarded as a minor, isolated component of wound assessment. Scoring systems that include assessment of exudate have been developed<sup>2-5</sup>. Complexity and/or reliance on subjective measures and experience of use may limit their application to practice. However, clinicians may choose to use a sophisticated tool, eg treatment evaluation by Le Roux's method (TELER)<sup>5</sup>, in routine practice and/or for cases that are difficult to manage.

A user-friendly, validated tool specifically for the assessment of exudate is awaited. Given the importance of exudate in wound healing and the variety of exudate-related problems, a major advance would be to systematically integrate exudate assessment into general wound assessment (Figure 4).

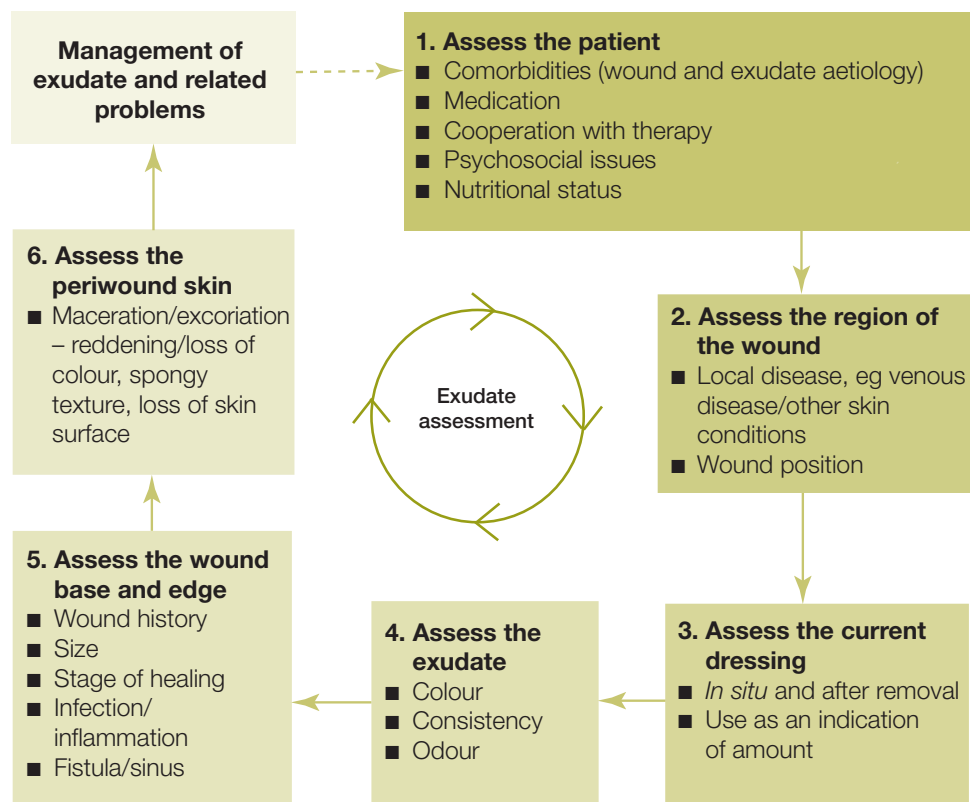
## INTEGRATED EXUDATE ASSESSMENT

### Assess the patient and the region of the wound

Explore how the patient and their carers feel about the wound and dressing. Encourage them to voice any concerns such as leakage, odour, discomfort, pain, emotional distress, sleep disturbance, and related social or financial difficulties. Look for factors that may be influencing exudate production and establish whether the patient accepts and cooperates with treatment. How will wound location affect exudate production, dressing performance and wound healing?

### Figure 4 | Integrated exudate assessment

At every stage, factors that may be influencing exudate formation should be sought and identified.



**Soiled dressings provide vital clues about exudate amount, colour, consistency and odour**



### Assess the current dressing

- **Evidence of leakage** – Inspect for leakage and any modifications made by the patient to contain exudate, eg the use of plastic bags. The floor, patient’s shoes, bed linen and clothes may also indicate leakage. Is odour detectable before dressing removal?
- **Assess any secondary dressings/bandages** – Is there strikethrough? Assess heaviness/wetness of the dressing, and colour, consistency and odour of exudate.
- **Assess the current primary dressing *in situ* and after removal** – Is there strikethrough? Assess the heaviness/wetness of the dressing, and colour, consistency and odour of exudate.
- **Ease of dressing removal** – Evaluate any dressing adherence. Assess the presence, quality and degree of any pain during the procedure.
- **Frequency of dressing change** – Is the frequency of dressing change appropriate for the patient and the wound? Has dressing change frequency changed recently? How long has the current dressing been in place? Ask the patient how long after dressing change strikethrough or leakage occurred.
- **Dressing type and fixation** – Is the dressing type appropriate? Is the dressing comfortable, conformable and flexible? Is the fixation appropriate for the patient and the dressing? Does the dressing stay in place? Does the method of fixation damage the skin? Is the seal provided by the dressing and fixation sufficient to prevent leakage?

Use information gained from assessing the current dressing and the wound to evaluate the interaction of the current dressing, the wound and the exudate (Table 3).

### Assess the exudate

Note the colour, consistency and odour of the exudate on the dressing and in the wound (page 3). Could infection, necrotic tissue or a particular contributory factor explain the findings?

### Assess the wound base/edge and periwound skin

Establish aetiology, stage of healing, size and depth, and condition of the wound base and edge. How far from the wound edge does any maceration/excoriation extend?

**Table 3 |** Evaluation of dressing:exudate interaction

Status	Indicators
Dry	■ Wound bed is dry; there is no visible moisture and the primary dressing is unmarked; dressing may be adherent to wound. <b>NB This may be the environment of choice for ischaemic wounds</b>
Moist	■ Small amounts of fluid are visible when the dressing is removed; the primary dressing may be lightly marked; dressing change frequency is appropriate for dressing type. <b>NB In many cases, this is the aim of exudate management</b>
Wet	■ Small amounts of fluid are visible when the dressing is removed; the primary dressing is extensively marked, but strikethrough is not occurring; dressing change frequency is appropriate for dressing type
Saturated	■ Primary dressing is wet and strikethrough is occurring; dressing change is required more frequently than usual for the dressing type; periwound skin may be macerated
Leaking	■ Dressings are saturated and exudate is escaping from primary and secondary dressings onto clothes or beyond; dressing change is required much more frequently than usual for dressing type



### APPLICATION TO PRACTICE

**Assess exudate in the context of the patient’s medical and surgical history, wound history, environment and psychosocial status**

**The interaction between the exudate and the dressing influences local management**

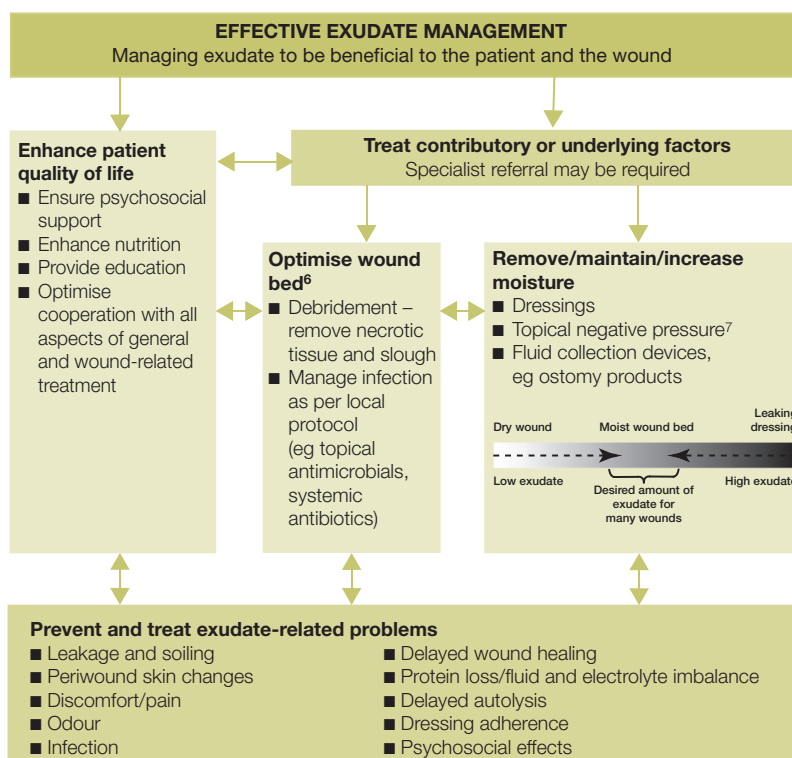


# MANAGEMENT OF EXUDATE

The importance of exudate in wound healing makes achieving a moist but not macerated wound bed the usual aim. Effective exudate management will require advice from a multidisciplinary team and the creation of individualised management plans. Systemic, local and wound-related interventions will contribute to modification of wound moisture (Figure 5). In addition, management must also specifically address exudate-related problems such as odour and pain.

**Figure 5 | Effective exudate management**

NB For a patient with a malignant wound, the formation of a crust or scab and no exudate production may be appropriate goals. For an uninfected ischaemic non-viable digit, mummification may be desirable to prevent wet gangrene.



6. European Wound Management Association (EWMA). Position Document: *Wound Bed Preparation in Practice*. London: MEP Ltd, 2004.

7. Jones SM, Banwell PE, Shakespeare PG. Advances in wound healing: topical negative pressure therapy. *Postgrad Med J* 2005; 81: 353-57.

## MANAGEMENT WITH DRESSINGS

In local wound management, dressings are the main option for managing exudate. Following integrated exudate assessment (page 5), the clinician will decide whether there is a need to change or maintain the current dressing regimen (Table 4).

**Table 4 | Strategies for achieving the desired moist wound environment**

Aim	Strategies*
Increase wound moisture	<ul style="list-style-type: none"> <li>■ Choose dressing type to conserve or donate moisture</li> <li>■ Use thinner (less absorbent) version of current dressing</li> <li>■ Decrease dressing change frequency</li> </ul>
Maintain wound moisture	<ul style="list-style-type: none"> <li>■ Continue current dressing regimen</li> </ul>
Reduce wound moisture	<ul style="list-style-type: none"> <li>■ Use thicker (more absorbent) version of current dressing</li> <li>■ Change to dressing type of greater fluid handling capability</li> <li>■ Add or use higher absorbency secondary dressing</li> <li>■ Increase frequency of primary and/or secondary dressing change</li> </ul>

\*NB It is important to review strategies regularly and expect need for adjustment

## MODE OF ACTION OF DRESSINGS

At a basic level, many dressings handle fluid by absorbing it and/or allowing it to evaporate. In addition, properties such as fluid retention and sequestration may be considered.

- **Absorption** – Fluid enters dressing materials by diffusion and by being drawn into spaces (capillary action or ‘wicking’). Simple absorptive dressings, eg foams and cotton, viscose or polyester textiles, hold fluid within spaces in their structure like a sponge. When these materials are placed under pressure, fluid is released from the spaces and may leak from the dressing.
- **Evaporation/transmission** – Many absorbent dressings also allow moisture to evaporate from the surface of the dressing. This characteristic is quantified as the moisture vapour transmission rate (MVTR). Semi-permeable films are not absorbent, and although impermeable to fluid and bacteria, allow water vapour to evaporate. Some films have a low MVTR, which may result in maceration from fluid held under the dressing. Dressings with a very high MVTR may be useful in managing exudate where minimal bulk is preferable, eg in malignant wounds on the face.
- **Fluid retention** – Interactive dressings, eg hydrocolloids, alginates and carboxymethylcellulose (CMC) fibres (Hydrofiber® dressings), take up liquid to form a gel. When placed under pressure, the gel changes shape but retains the fluid. Materials that form uniform cohesive gels are generally more likely to stay intact during use and may reduce lateral tracking of fluid and the risk of periwound maceration. This is particularly useful under compression.
- **Sequestration of exudate components** – *In vitro* studies have demonstrated that some dressings, eg CMC fibres and some alginates, trap bacteria and exudate components such as enzymes in a process termed sequestration<sup>8</sup>. Materials such as CMC fibres that produce a uniform coherent gel appear to have enhanced sequestration<sup>8</sup>. Further evaluation of the clinical impact of this effect is required.

8. Newman GR, Walker M, Hobot JA, Bowler PG. Visualisation of bacterial sequestration and bactericidal activity within hydrating Hydrofiber® wound dressings. *Biomaterials* 2006; 27: 1129-39.



**Dressings should be used in the context of an integrated management plan (page 7) and be evaluated at each dressing change**

9. Vowden K, Vowden P. The role of exudate in the healing process: understanding exudate management. In: White R (ed). *Trends in Wound Care: Volume III*. Salisbury: Quay Books, MA Healthcare Ltd, 2004; 3-22.

## Effects on exudate composition

Some dressings, by removing water or other components, alter the consistency and potentially concentrate or influence the composition of the exudate that remains in the wound. The clinical significance of these effects is unclear<sup>9</sup>. Dressings containing collagen/oxidised-regenerated cellulose reduce proteolytic enzyme activity. Dressings containing hyaluronic acid also decrease levels of inflammatory mediators.

## Use of dressings in infected wounds

When a wound is infected, dressings are sometimes used to hold an antimicrobial, eg metronidazole gel, in contact with the wound bed. The frequent association of increased exudate production and infection has resulted in the formulation of dressings that combine fluid handling with an antimicrobial, eg silver or iodine. Antimicrobial dressings should only be considered after thorough assessment and investigation.

## SELECTING DRESSINGS FOR EXUDATE MANAGEMENT

It is important to note that some dressing materials are available in several different forms (eg flat sheets of varying thickness, pastes/gels, ropes) and that individual dressings are often formulated to combine physically distinct layers of different materials (Table 5). As a result, the properties and usages of individual dressings of the same broad type can vary considerably.

**Table 5 | Dressing materials for fluid handling**

This table is intended to provide a broad overview of the indicated usages of dressing materials for fluid handling. The properties and licensed usages of individual products within the generic groups will vary and may differ from the broad generalisations made. The dressing type chosen for a particular wound is influenced by many factors including wound healing stage and the rate of healing progression.

Dressing material*	Indicated usage			
	Fluid conservation/ donation	Fluid control** Light	Medium	High
Permeable non-adherent wound contact layers (eg knitted viscose primary dressing)		✓		
Cotton, polyester or viscose fibres or fabrics		✓ mainly used as secondary dressings	✓	✓
Semi-permeable films	✓	✓		
Sheet hydrogels	✓	✓		
Amorphous hydrogels	✓	✓		
Sheet foams		✓	✓	✓
Cavity foams			✓	✓
Hydrocolloids		✓	✓	
Alginates			✓	✓
Carboxymethylcellulose fibres (Hydrofiber® dressings)			✓	✓

\*Porous ceramic beads and cadexomer beads are under investigation for the management of exudate

\*\*Further research is required to clarify what constitutes low, medium and high exudation. This document recommends using the dressing *in situ* as a guide to level of exudate production (see Table 3) and the suitability of the selected dressing



**Careful attention must be paid to the manufacturers' instructions for dressing use. Clinicians using dressings creatively should be aware of the responsibilities of doing so**

**Criteria for dressing selection**

Dressing choice will be determined mainly by the ability of the dressing to achieve the desired exudate level (page 7), to assist healing and/or to prevent deterioration of wounds not expected to heal. In addition, the clinician should ask the following questions:



**Does the dressing:**

- stay intact and remain in place throughout wear time?
- prevent leakage between dressing changes?
- cause maceration/allergy or sensitivity?
- reduce pain?
- reduce odour?
- retain fluid (eg under compression)?
- trap exudate components (ie sequester)?

**Is the dressing:**

- comfortable, conformable, flexible and of a bulk/weight that does not impede physical activity?
- suitable for leaving in place for a long duration?
- easy to remove (does not traumatise the surrounding skin or wound bed)?
- easy to use?
- cost-effective?

**Difficulty containing exudate, managing infection or protecting periwound skin should prompt consideration of an alternative dressing or intervention. If problems persist, patient referral should be considered.**

10. Phillips T, Stanton B, Provan A, Lew R. A study of the impact of leg ulcers on quality of life: financial, social, and psychological implications. *J Am Acad Dermatol* 1994; 31: 49-53.

11. Persoon A, Heinen M, van der Vleuten C, et al. Leg ulcers: a review of their impact on daily life. *J Clin Nurs* 2004; 13: 341-54.

12. World Union of Wound Healing Societies. *Principles of best practice. Minimising pain at wound dressing-related procedures. A consensus document.* London: MEP Ltd, 2004.

**MANAGEMENT OF EXUDATE-RELATED PROBLEMS**

Problem	Principles of management
Psychosocial effects <sup>10,11</sup>	<ul style="list-style-type: none"> <li>Ask the patient and their carers about psychological and social problems</li> <li>A particular regimen may be required to accommodate the patient's day-to-day needs or a specific goal (eg wedding)</li> <li>Involve the patient and carer in management decisions</li> <li>Treat/prevent exudate-related problems</li> <li>Evaluate regularly and consider whether specialist referral is required</li> </ul>
Leakage and soiling	<ul style="list-style-type: none"> <li>Review management of systemic and local contributory factors</li> <li>Consider a thicker dressing of the same type or a different dressing type with a higher fluid handling capacity</li> <li>Consider secondary absorbent dressing (if not already in use)</li> <li>Ensure dressing seal is effective</li> <li>Consider referral if contributory factors or leakage are difficult to control (ostomy products or topical negative pressure may be indicated)</li> </ul>
Frequent dressing change	<ul style="list-style-type: none"> <li>As for leakage</li> <li>Consider use of a permeable non-adherent contact layer with a secondary absorbent dressing, changed as required to minimise wound bed disturbance</li> </ul>
Periwound skin changes	<ul style="list-style-type: none"> <li>Take action to prevent wound expansion</li> <li>Is the cause contact with exudate, dressing sensitivity/allergy or a dermatological condition?</li> <li>Treat any inflammation as appropriate</li> <li>Minimise skin contact with exudate and protect periwound skin with a suitable barrier</li> <li>Increase fluid handling capacity of dressings</li> <li>Consider atraumatic dressings and methods of fixation</li> </ul>
Discomfort/pain <sup>12</sup>	<ul style="list-style-type: none"> <li>Identify cause – how is exudate contributing to discomfort/pain?</li> <li>Sudden increase in pain may be indicative of infection</li> <li>Control excessive exudate and prevent/treat maceration and excoriation</li> <li>Avoid/treat adherence of dressing to wound bed (see below)</li> <li>Consider topical/systemic analgesic use</li> </ul>
Odour	<ul style="list-style-type: none"> <li>Remove necrotic tissue as appropriate</li> <li>Reduce bioburden and manage underlying infection</li> <li>Consider increasing dressing change frequency</li> <li>May need to consider odour absorbing charcoal-containing dressings</li> </ul>
Infection	<ul style="list-style-type: none"> <li>Remove necrotic tissue as appropriate</li> <li>Follow local protocols regarding use of systemic/local antimicrobials</li> <li>Avoid increasing bioburden by preventing strikethrough and leakage</li> </ul>
Delayed healing	<ul style="list-style-type: none"> <li>Reassess patient and wound, checking for cooperation with treatment</li> <li>Remove necrotic tissue and manage infection as appropriate</li> <li>Ensure optimal moisture level</li> <li>Consider change of dressing type or use of advanced therapy</li> </ul>
Protein loss/fluid and electrolyte imbalance	<ul style="list-style-type: none"> <li>Treat underlying cause and optimise nutrition</li> <li>Ensure wound haemostasis</li> <li>Consider referral if fluid loss is severe</li> </ul>
Delayed autolysis	<ul style="list-style-type: none"> <li>Consider debridement</li> <li>If the wound is dry, increase wound moisture by using a dressing of lower fluid handling capacity or one that retains or donates moisture</li> </ul>
Adherence of dressing to wound bed	<ul style="list-style-type: none"> <li>Use low adherence atraumatic dressings</li> <li>Reconsider dressing choice, eg increase wound moisture by using a dressing of lower fluid handling capacity</li> <li>Reconsider frequency of dressing change</li> <li>Consider moistening dressing before removal</li> </ul>



**A management plan, informed by thorough assessment, will deal with many exudate-related problems. If problems continue, don't accept them, re-address them**