Understanding & guarding against MARSI
Medical Adhesive-Related Skin Injuries
Protect your patients.
Patient care begins with skin.

Skin is the body’s largest organ. It protects us from the environment and disease, helps us regulate body temperature, collects essential vitamin D from the sun and provides us with our sense of touch.

With the maintenance and restoration of skin integrity being regarded as an indicator for quality patient care, skin care is an integral part of the nursing practice in every care setting. We understand that helping you keep patients comfortable while protecting the skin from the unnecessary injury and pain associated with Medical Adhesive-Related Skin Injuries (MARSI) is of utmost importance. As your ally in care, we’re providing a wide range of medical tapes and skin-friendly products to maintain and protect the integrity and health of this vital organ.

What causes MARSI?

There is no simple answer. MARSI occurs during a convergence of factors, including:

- The current condition of the patient’s health and skin, including allergies, age and several other factors.
- Lack of product choice. Sometimes there aren’t as many tape options to work with as clinicians would like.
- Lack of product education and usage guidelines to understand why one product is preferable over the other.
- Tape application technique. How tape is applied can set the stage for maintaining skin health.
- Tape removal technique. Proper removal is critical and often there is no training available.

Various factors can influence the risk of skin injury, such as age-related issues, the presence of dermatological conditions or other underlying medical conditions including malnutrition, dehydration, prolonged exposure to moisture, certain medications, radiation therapy, photodamage and previous use of adhesive products.

Impact of MARSI.

Despite the fact that MARSI continues across care specialties, the prevalence of MARSI is largely unknown. For patients, it’s a negative experience and, as part of the Affordable Care Act Patient Experience, hospitals are being rated on patient satisfaction. Reducing the risk of MARSI is one way for a care setting to achieve positive ratings from patients.

What are Medical Adhesive-Related Skin Injuries or MARSI?

MARSI is the red, irritated skin that may occur on your patients when medical adhesives are removed. It can affect skin integrity, cause pain, increase risk of infection and delay healing, all of which reduce a patient’s quality of life. It can be a complication that occurs across all care settings and age groups and can sometimes be serious enough to require additional treatment.
Those most at risk.

While any patient who comes in contact with medical adhesives can potentially experience MARSI, certain groups of people are more vulnerable. Identifying these higher-risk patients is a key component of risk reduction.

- **Elderly patients.** Skin changes inherent to the aging process, such as thinning of the skin, increase the risk of skin injury in older adults. Other changes include loss of dermal matrix and subcutaneous tissue; epidermal thinning; reduced cohesion between the dermal and epidermal layers; reduced vascularity, elasticity, tensile strength; and loss of moisture.

- **Infants.** Neonatal skin is 40% to 60% thinner than adult skin, largely due to the presence of fewer epidermal cell layers in the stratum corneum. Such delicate skin must be treated with extra care. The most common MARSI seen in neonatal patients is skin stripping. Chronically hospitalized infants may also experience irritant contact dermatitis due to a variety of adhesive products.

- **Orthopedic surgery patients.** Skin injuries are more prominent in this setting in part because of the use of large amounts of tape to hold large compression bandages securely, and the risk of tape damage is compounded by joint movement, skin friction and the presence of tissue edema, which creates a strapping effect.

- **Other higher-risk patients include:**
  - Those with chronic skin conditions such as eczema, dermatitis, chronic ulcers and epidermolysis bullosa.
  - Those with underlying medical conditions, such as diabetes, infection, renal insufficiency, immunosuppression, venous insufficiency or hypertension.
  - Oncology patients.
  - Steroid-dependent patients.
  - Dialysis patients.
  - ICU patients.
  - Patients undergoing radiation treatments.
  - Patients suffering from malnutrition and/or dehydration.
Identifying MARSI.

MARSI can take several forms. It results when adhesive attachment to the skin is stronger than the patient’s own skin cell-to-cell attachment. Removing or repositioning tape can cause epidermal layers to separate. In mild cases, there may be no visible trauma, but in other cases irritation and injury can be more obvious.
Steps to reduce the risk of MARSII.

Reducing the risk of MARSII is paramount to good patient care. By learning more about risk reduction strategies, you can play an important role in reducing incidents.

Assessment

When using medical adhesives, the skin should be assessed on a daily basis for evidence of damage. This is especially important for those patients who are at higher risk for MARSII. Try to have good lighting and check the skin for color, texture, uniformity of appearance and integrity.

Additionally, be sure to gather a history of patients’ allergies and sensitivities to minimize the risk of MARSII due to allergic reactions. It has been found that 3% to 50% of patients with atopic or contact eczema, allergy, or asthma in their medical history experienced a skin reaction from adhesive materials during a preoperative skin test. Based on established knowledge, these patients are believed to be likely to experience a reaction to the same adhesive material if it were to be used in a wound area.12

Minimize Risk

Identification of patients at high risk for MARSII is a key component of risk reduction. Extra precautions may be necessary, such as using a gentler tape, e.g., 3M™ Kind Removal Silicone Tape and/or barrier products such as 3M™ Cavilon™ No Sting Barrier Film.

Product Selection and Application

Right tape. Right application. Select the most appropriate adhesive product based on its intended purpose. Consider where it will be attached on the body. For example, facial skin may be more sensitive than skin on the leg or arm. Think about adhesive gentleness, breathability, stretch, conformability and flexibility. 3M has a comprehensive line of tapes, from soft cloth and foam to our innovative silicone tape, which is very gentle to skin.

Tape Application

Proper tape application sets the stage for avoiding MARSII. 3M has detailed guidelines and tips for applying tape in many situations.56

Proper Removal

Proper tape removal is also critical in reducing the incidence of MARSII. Awareness of, and training on, the latest techniques for applying and removing medical adhesive products can help to minimize the risk of MARSII and increase the consistency of care across your facility.2,15,16

Treatment

The same general principles used to manage other wounds should be employed when treating MARSII.

For more information regarding steps to reduce the risk of MARSII, go to 3M.com/MARSII and download the consensus statement, Medical Adhesives and Patient Safety: State of the Science.
The science of securing to skin: Two adhesive choices offer the flexibility you need.

The science of adhesives is one of the cornerstones of 3M’s business. In fact, we invented the category of gentle-to-the-skin medical tapes more than 50 years ago, and we continue to improve our products to help meet your needs and create better patient outcomes.

Acrylate Adhesive

Acrylate adhesives continue to be the most common adhesive used for patient care. These initially adhere to the skin cells closest to the top, leaving some gaps in adherence. Over time the adhesive fills the gaps and strengthens as it forms a tighter bond with the skin, making it ideal for situations where increased securement or longer wear is needed.

Silicone Adhesive

Silicone adhesive is very gentle and conforms to the uneven surfaces of the skin immediately and remains constant throughout wear time. Unlike acrylate adhesives, silicone adhesives have lower surface tension, making them the preferred choice for those patients with at-risk or fragile skin or when more frequent dressing changes are required.

Protection From Other Adhesives

When working with adhesives that aren’t silicone-based, you may want added protection for your patients. 3M™ Cavilon™ No Sting Barrier Film forms a protective barrier between skin and the adhesive of the securement, dressing, device or tapes to help reduce the risk of skin trauma before it occurs.

Proven Comfort — An Example of Silicone Adhesives

Meet our 3M™ Kind Removal Silicone Tape. This tape provides reliable securement, kind removal and gentle care without compromise. Research confirms that upon removal, 3M™ Kind Removal Silicone Tape causes minimal epidermal cell stripping and less pulling of hair. Patients will feel the difference the moment it goes on and comes off.*

Soft, comfortable and different than any other tape. 3M™ Kind Removal Silicone Tape is ideal for patients with sensitive, compromised or at-risk skin. It continues to adhere well even when repeated taping is necessary.

*3M Clinical Data on file (2010/2011)
The right tape for the right situation.

Not all medical tapes are the same. After all, certain situations call for specific adhesive requirements, and clinicians appreciate having a wide variety of reliable, consistent 3M tapes at hand.

You can give your patients the best possible care and help minimize the risks of MARSII by selecting products that match both your needs and your patient’s.

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<th>PRODUCT</th>
<th>NEEDS:</th>
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<tr>
<td></td>
<td>Tapes for everyday use</td>
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<td>3M™ Kind Removal Silicone Tape</td>
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<td>3M™ Medipore™ H Soft Cloth Surgical Tape</td>
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<td>3M™ Transpore™ White Surgical Tape</td>
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Proper application and removal.

Awareness of, and training on, the latest techniques for applying and removing medical adhesive products can help to minimize the risks of MARSI and increase consistency of care across your facility. See specific product manufacturer’s labeling for any additional or contrary directions related to preparation, application and removal.

Prepare the Skin

- Clip/trim hair.
- Clean and dry the skin to remove soil and/or residue from medical grade adhesive remover, moisturizer or lotion.

Apply the Tape

- Apply 3M™ Cavilon™ No Sting Barrier Film, to protect at-risk skin.
- Allow barrier film to dry completely before applying tape.
- Avoid routine use of tackifiers.

Application Tips

- Tape should not be pulled or stretched when applied.
- Minimize touching adhesive surface to retain adhesive levels.
- Avoid gaps and wrinkles that can allow moisture to get between the tape and the skin, tubing or dressing.
- Do not encircle a limb completely with tape.
- If swelling occurs, loosen and replace tape. 3M™ Kind Removal Silicone Tape can be repositioned without compromising adhesion.
- When securing dressings, tape should extend a minimum of one-half inch (one inch is preferred) beyond the edge of the dressing to hold the dressing in place.

Remove the Tape

Proper tape removal is critical in reducing the incidence of MARSI.

- Loosen edge of tape.
- Stabilize the skin with one finger at the peel line.
- Remove tape “low and slow” in the direction of hair growth, keeping it close to (parallel with) the skin surface while pulling it back over itself.

Tip: To start the edge, press a small separate piece of tape onto a corner of the piece to be removed. This serves as a handle for lifting the edge of the tape.

Tip: For tape that is strongly adhered to skin or hair, consider using a medical grade adhesive remover or moisturizer to soften the adhesive along the peel line (peel edge).

Pulling tape at a vertical angle (perpendicular) to the skin will pull at the epidermis, increasing the risk of MARSI.

As tape is removed, continue to support the skin at the peel line.

Special applications.

Securing Tubing: Omega Technique

Optimal technique for securement and to reduce potential pressure under tubing.

1. Center tape over tubing: encircle tubing with tape.
2. Where tape meets, pinch the two adhesive sides together.
3. Secure remainder of tape to skin.

Securing Tubing: Chevron Technique

Optional technique to help keep tubing securely in place; works best with thin tape strips or conformable tapes.

1. Center tape with adhesive side up, under tubing.
2. Cross one section of tape over tubing and secure to skin.
3. Repeat with other side of tape.

Prepare the Skin

- Clip/trim hair.
- Clean and dry the skin to remove soil and/or residue from medical grade adhesive remover, moisturizer or lotion.

Apply the Tape

- Apply tape to skin without stretching or tension.

Application Tips

- Apply firm pressure to activate the adhesive and gain full contact with the skin.
- Tape should not be pulled or stretched when applied.
- Minimize touching adhesive surface to retain adhesive levels.
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Protecting patient comfort and safety.

The earliest medical tapes were far from ideal. They blocked perspiration, irritated the skin and were painful to remove. Clinicians were looking for a non-irritating, breathable tape for long-term use. In response to this need, a team of 3M scientists began their quest for a better medical tape. 3M has now been developing and improving medical adhesives for over 50 years.

3M convened a panel of 23 recognized key opinion leaders to establish consensus statements to serve as guidelines for proper assessment, prevention, product selection and usage and treatment of skin injuries.

To download the Consensus Statement from this summit, go to 3M.com/C3SD.

To learn more about how 3M can help you and your facility reduce the risk and treat MARSIs, contact your 3M Critical & Chronic Care Solutions representative or call the 3M Health Care Customer Helpline at 1-800-228-3957. Outside of the United States, contact the local 3M subsidiary.

References:

*The Consensus Summit was made possible by an unrestricted educational grant from 3M.