BREAST RECONSTRUCTION
DEEP INFERIOR EPIGASTRIC PERFORATOR (DIEP) FLAP
By Dr. Bish Soliman

This information sheet is for women who are considering a breast reconstruction using a DIEP flap by Dr. Bish Soliman. Dr. Soliman favours this approach of using your own tissue (autologous tissue) because it can provide a long-lasting natural-looking breast that will age and vary in size depending on your weight.

Dr. Bish Soliman is a highly skilled and experienced specialist plastic surgeon who has completed an overseas microsurgery fellowship in breast reconstruction with the world-renowned Professor Edward Buchel. Dr. Soliman also completed an aesthetic fellowship and understands the importance of aesthetic proportions when creating a post-mastectomy breast reconstruction. We know this maybe a difficult time for you, but studies have shown that reconstructive breast surgery improves the quality of life in those who undergo reconstruction. The Soliman Plastic Surgery (SPS) team have a holistic approach to patient care and customise their care to your every needs.

What is a DIEP flap reconstruction?

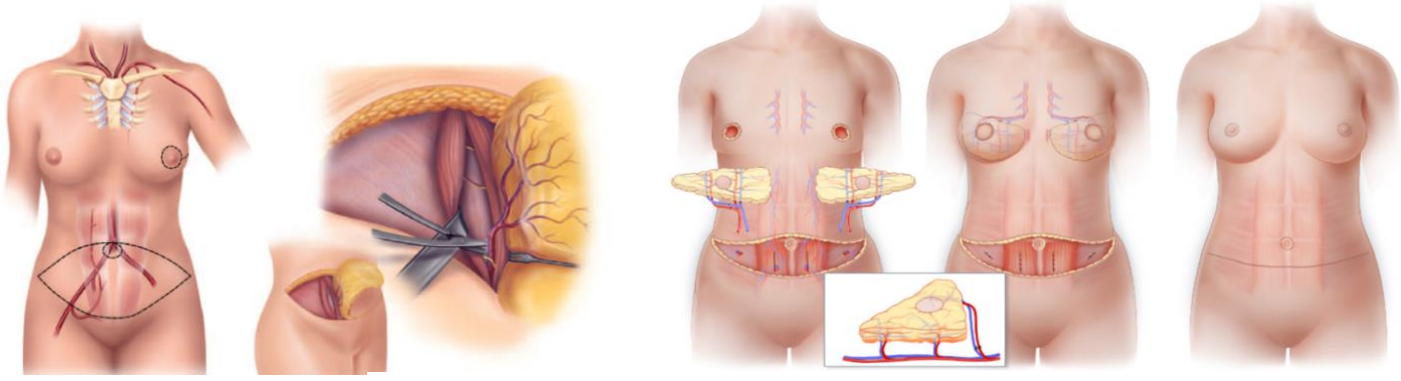
The acronym DIEP stands for Deep Inferior Epigastric Perforator Flap, which is the main blood vessel that this flap is based on. A flap is the process of removing a piece of skin, fat, and blood vessels from your lower abdominal region (below the belly button) and transferring it to your chest area to create a breast. Your rectus muscle (six pack) is **NOT** sacrificed with this operation, and Dr. Soliman takes the time to preserve the nerves that supply your rectus muscle, which means that your abdominal strength is maintained long-term, and the recovery is quicker. The DIEP flap is recognised as the gold-standard for breast reconstruction.

The reconstruction may be performed at the same time as your mastectomy *(immediate reconstruction)* or at a later date *(delayed reconstruction)*. Your breast surgeon and Dr. Bish Soliman will decide whether to perform an immediate or delayed reconstruction in consultation with you. Factors relating to your breast cancer treatment and other circumstances must be considered.

Immediate Breast Reconstruction

Immediate breast reconstruction is a joint procedure between your breast surgeon and Dr. Bish Soliman. This means that the two operations – the mastectomy and the reconstruction – are performed during the same anaesthetic.

An incision is made to allow removal of the breast tissue (this may include the nipple and areola) while preserving the breast skin. Dr. Soliman may speak to you about tightening your breast skin at the same time to give you a more lifted



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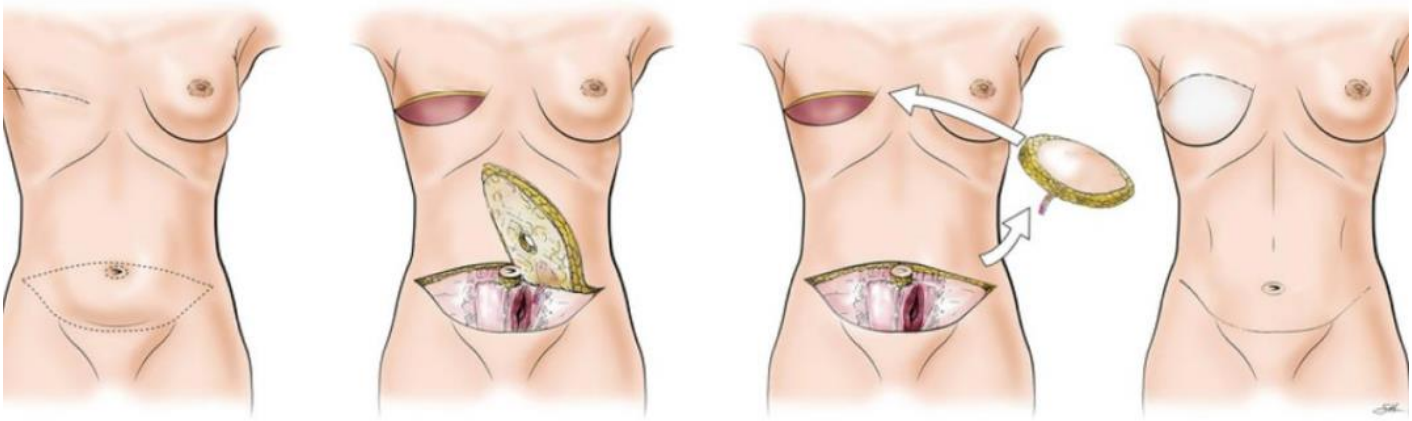
appearance. The breast skin is then filled with the DIEP flap (fat and skin taken from your abdomen). The blood vessels taken with the tissue from your abdomen are connected to blood vessels in the chest (the internal mammary vessels) using microsurgical techniques. The flap will then be shaped to create the new breast. An area of skin from the abdomen will be left to act as a 'monitoring paddle' to ensure the transplanted tissue is healthy. Most of the skin of the new breast mound is original breast skin.

Delayed Breast Reconstruction

This surgery is performed by Dr. Bish Soliman sometime after your mastectomy and other cancer treatment. This surgery transfers a larger area of skin to your chest wall along with fat and blood vessels to replace the deficient chest wall skin and form a breast. The end result of a delayed reconstruction is also very good. The post-operative management is the same whether you have an immediate or delayed breast reconstruction.



Is a DIEP flap suitable for me?

Dr. Soliman will discuss the suitability of a DIEP flap with you. There are five things to consider:

(i) Current Health – If you are a smoker or have multiple medical problems then your risk of complications increases.

(ii) Body Shape – You should have excess lower abdominal skin and fat to have a DIEP. If you carry your extra fat in other areas, then Dr. Soliman will discuss using other areas of your body such as your inner thighs or lower back for breast reconstruction. *Dr. Soliman is one of only a few plastic surgeons that offers these alternative reconstructions.*

(iii) Past Surgeries – Having prior abdominal surgeries is rarely a problem unless you've previously had an abdominoplasty.

(iv) Treatment Needs – The timing of the DIEP may be related to other treatments that you may need such as chemotherapy or radiotherapy.

(v) Personal Preference – Every patient should understand all breast reconstruction options and make an informed decision. Some women who might be able to use their abdominal tissue may not chose to do so. A DIEP is always an option later if you choose an implant reconstruction to begin with.

Preparation for breast reconstruction

The following steps apply to both an immediate and a delayed reconstruction.

1. Consultation with both your breast surgeon and Dr. Bish Soliman. During your visit with Dr. Soliman, he will take a detailed history, examine you, take clinical photographs, and discuss whether a DIEP flap is suitable for you. He will also show you before and after photographs.
2. Dr. Soliman will order a CT Angiogram of your abdomen looking at the anatomy of your blood vessels. It is important to have this done one week prior to your surgery date so that Dr. Soliman can carefully plan the details of your operation. A request form will be given to you at your appointment. Dr. Soliman prefers you to have this scan at North Shore Private Radiology. The out-of-pocket cost is $80.

North Shore Radiology and Nuclear Medicine
North Shore Private Hospital
Ground Floor, Westbourne Street
St Leonards NSW 2065
Tel (02) 8425 3666

3. Pre-procedure blood test. Dr. Soliman will refer you to have routine blood tests
4. Pre-procedure phone call by the Anaesthetist to discuss the general anaesthetic and post-operative pain management plan.
5. Pre-admission phone call by the hospital. Dr. Soliman operates from:
    a. Royal North Shore Hospital, St Leonards
    b. North Shore Private Hospital, St Leonards
    c. Mater Hospital, North Sydney
    d. Westmead Adults Hospital, Westmead
    e. Westmead Private Hospital, Westmead

    During this phone call you will be asked about any medication you are taking, including prescription, herbal, or alternative medicines. You may be advised to stop taking certain medications before you're surgery and will be advised what time to fast from and come in for surgery.
6. If you smoke, Dr. Soliman strongly advises that you stop at least six weeks prior to your surgery to reduce the likelihood of wound healing complications. We know that stopping smoking at times of stress is particularly difficult. *Your GP can refer you to the QUIT program if you need help to stop smoking.*

What do I need to bring into hospital?

1. Supportive bra

We recommend a wireless bra that has wide shoulder straps as well as a wide supportive back. A bra with a front opening may be helpful. It can be difficult to identify the correct size before your reconstruction. We advise you buy a size larger (across the band) than what you normally wear to allow room for swelling; for example, a 16C instead of a 14C. Patients are required to wear a bra once mobilising on the ward. The bra helps to support the newly formed breast, reducing swelling and bruising, while supporting the shape.

2. Singlet

After the procedure Dr. Soliman will fit you with an abdominal binder, which you will need to wear day and night for 6 weeks. Some patients find that this can irritate their skin, so we advise you bring a singlet with you to place as a barrier between your skin and binder.

3. Toiletries, slippers, and bed wear

Loose fitting pyjama tops with buttons are recommended while in hospital.

Day of Surgery

A DIEP flap requires general anaesthesia and a five-to-seven-day hospital stay. In the morning you will be asked to arrive early, fasted (usually from midnight the night before), and get checked in at the admission desk. You will then change into a hospital gown and have your details checked prior to being taken to the holding bay in theatre. Once you have arrived, Dr. Soliman will review you and make some skin markings, before taking clinical photographs. You will then be reviewed by the anaesthetist, a canula will be placed into your hand, and you will be taken into theatre to have your surgery.

How long does the operation take?

A unilateral DIEP takes 4-5 hours.

A bilateral DIEP takes 6-8 hours.

What to expect after surgery?

After surgery you will spend some time in the recovery room before being transferred to either the ward or the Intensive Care Unit (ICU). You will be monitored very closely in the first few days with your own dedicated nurse. This allows your breast flap to be checked hourly as its important to ensure good blood supply to the flap. If there is any concern, then you will be returned to the operating theatre immediately.

For the first two days following surgery, you will be kept warm with a heating blanket to support blood supply to the breast flap. You will also be asked to keep your arm movements to a minimum. This allows the newly joined blood vessels to heal.

Dissolvable skin sutures will be used to close all your incisions and will be covered with surgical dressings. Your belly button will be brought out in the same position as before and you will have a scar around it. The incision to the abdomen extends from hip to hip and is positioned as low as possible.

On your abdominal incision Dr. Soliman uses a Prevena negative pressure vacuum dressing (PREVENA™) which stays on the wound for one week before being removed, this adds further protection to your suture line. It is safe for you to mobilise with this dressing on. Your abdomen may feel very tight for some time following this surgery but will loosen with time. Most patients will have reduced sensation to both the breast and abdomen. The degree to which this sensation returns varies. It will take up to six months for your reconstructed breast to settle into its final shape.

Drain tubes

You will have drain tubes inserted to remove excess fluid from the surgical site; one on either side of your abdominal suture line and two draining each breast. These remain in place until they have less than 20mls of drainage in a 24-hour prior to you being discharged home. If this is not possible, a community nurse will be organized to visit you at home to remove it. period for two consecutive days. This generally takes three to five days. The SPS team aim to remove all drain tubes.

Catheter

At the beginning of your operation, you will have a urinary catheter passed into your bladder. This will be removed after 48-72 hours. You can then start wearing your own pyjama pants.

Oxygen
After your operation you will be given oxygen via nasal prongs. This will continue until your oxygen levels return to normal. It is important that you receive chest physiotherapy to ensure that you expand your lung bases and don't develop a lung infection.

Intravenous infusion
An IV drip (intravenous infusion) will be inserted to help keep you hydrated in the first 24 hours after surgery. You will also receive pain relief and antibiotics through the drip.

Diet
Dr. Soliman will prescribe you a clear fluid diet that evening and will slowly increase it over the next few days. He will also prescribe you aperients to open your bowels to reduce the risk of post-operative nausea.

Sequential Compression Devices (SCD)
Due to the long surgery time, there is an increased risk of developing a deep vein thrombosis (DVT). A DVT is a blood clot that forms in the veins of the leg. To reduce this risk, you will be prescribed daily blood thinning injections and be given SCDs and TED stockings to wear. Dr. Soliman advises you wear your compression stockings for 2 weeks after discharge until you resume back to your normal daily activities.

Pain
You can expect to have some discomfort or pain following surgery. You may feel tightness across your abdomen with some cramping. This is due to your diastasis repair (suturing together of your six pack muscles in the midline) to create a more aesthetic abdominal closure. Most patients manage this well with the help of pain medication and support from nursing staff and your physiotherapist. Your anaesthetist will prescribe intravenous patient-controlled analgesia (PCA). This minimises the risk of side effects and provides a quicker recovery.

Physiotherapist/Arm exercises
A physiotherapist will visit you several times while you are recovering from your surgery. The physiotherapist will show:

- techniques to reduce the risk of a chest infection following a general anaesthetic
- ways to protect your healing wounds when moving
- exercises to help you regain strength and movement in your arm(s).

When can I get out of bed?
You will be encouraged to get out of bed the first day after your surgery.

When can I shower?
You can shower once all your drains have been removed.

Discharge planning
The SPS team understand that each patients journey to recovery will be different and will tailor the post-operative management to accommodate this. However, most patients are ready for discharge between five and seven days after surgery. The typical post-operative journey can be summarised below.

Day 0 post-op	Close observation in Intensive Care. Hourly flap observations. Clear fluid diet
Day 1 post-op	Upgrade of diet. Sit out of bed. Chest physiotherapy
Day 2 post-op	Removal of catheter. Mobilise. Two Hourly flap observations
Day 3 post op	Removal of drains <20mls. Cessation of IV PCA. Conversion to oral antibiotics. Removal of IV drip. Aim for bowels to be opened. 4 hourly flap observations
Day 4 post-op	Removal of drains <20mls. Flap observations once per nursing shift
Day 5 – 7 post op	Full dressing change and discharge home

You should plan to have support in place for the first two weeks at home. During this time, you should avoid any physical activity apart from continuing your arm exercises and gentle walks. After these first two weeks you may slowly increase your physical activity, ensuring that you are not doing anything that causes pain.

Dr. Soliman advises that you only do light physical activity until six weeks after surgery and don't lift anything greater than 10kg. You can expect to be tired often following surgery. Listen to your body and try to strike a balance between rest and activity. It is expected that it will take 12 weeks before you fully return to your pre-surgery self.

Driving

Because of limited arm movement and the time needed to recover from tiredness as a result of your surgery, Dr. Soliman advises waiting two weeks before driving.

Scar management

All incisions produce scars, which will continue to change over the next two years. However, some scars may be troublesome, causing hypertrophic or keloid scars (red, raised, itchy). Our aim is to minimise scarring by:

Week 1 to 2

Brown Micropore paper tape is applied to support your wound and helps to flatten the scar. The tape is to be worn continuously and changed every few days. You are able to shower with the tape on, but ensure you dry it off afterwards.

Week 3 to 6

Massage and moisturising with a gentle cream (e.g. Cetaphil Moisturising Cream, sorbolene), then apply micropore tape. This will help soften the scar and break up any underlying scar tissue. This will encourage the scar to become flatter and smoother. Massages should be done in a firm circular motion along the length of the healed scar. Massage any scars three to four times a day for at least five minutes each time.

6 weeks to 12 months

Silicone gels and sheets can be used to help lock in moisture as well as put pressure on a scar to flatten and soften it. Silicone should only be used on wounds once they are completely healed.

Follow up appointment with Dr. Bish Soliman

Dr. Soliman will see you in his rooms two weeks after discharge, then at 3 months. Dr. Soliman will discuss with you minor secondary procedures such as lifting the unaffected side to match the reconstructed side, "touch-up" liposuction, lipofilling, and nipple reconstruction. These procedures are less involved than the DIEP flap and are day surgeries that do not require an overnight stay.

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What are the potential complications?
Any invasive surgical procedures have risks. The most common complications with a DIEP flap are:

- ***Haematoma:*** A haematoma is a collection of blood inside the body. The risk of this is 2%. If this develops, then you may need to be returned to the operating theatre for evacuation.
- **Infection:** Infection is rare. Antibiotics are given at the time of the surgery to reduce the chances of infection occurring.
- ***Seroma or build-up of fluid:*** This sometimes happens after the abdominal or breast drains have been removed, but it usually gets better within a few weeks. It occurs in approximately 1 in every 20 women. The fluid can be simply drained using a needle. If the seroma formation is recurrent, then a steroid injection may need to be applied. The seroma or its treatment does not usually have any long-term consequences.
- ***Lumps in the reconstructed breast (fat necrosis):*** If the blood supply to some of the reconstructed fat is poor, this will form fat necrosis and replaced by scar tissue (lump). These lumps may or may not go away with time. Dr. Soliman will advise you to massage these lumps and if they don't resolve they may need to be surgically removed.
- ***Asymmetry:*** Most women's breasts are asymmetrical. With advancing age, the breast also tends to ptose or droop. It is rarely possible to achieve perfect symmetry. Dr. Soliman may need to perform secondary minor surgery to help with this.
- ***Abdominal bulge or hernia:*** Weakness of the abdominal wall after a DIEP flap procedure may produce a bulge. Very rarely, damage to the muscle may produce a hernia that will require additional surgery for correction. This is an extremely rare complication because the abdominal muscle is left intact along with its nerves, which is the great advantage of the DIEP technique compared to the previously used TRAM flap breast reconstruction.
- ***Flap loss or failure:*** This rarely happens but it is a serious complication. The nursing staff and Dr. Soliman will closely check on the new tissue of the reconstructed breast in the first few days after the operation. If there are any signs of a problem, you may need to go back to the operating theatre to have it checked. About 1-2 in 100 women who have a DIEP flap may need one of these 'second checks'. Very rarely, the new tissue in the breast fails and an alternative method of reconstruction is needed
- ***Hypertrophic Keloid scaring:*** Some patients are predisposed to abnormal scarring. Dr. Soliman aim's is to minimise scarring by meticulously closing all wounds and by providing post-operative scar management advice.

Useful websites
https://plasticsurgery.org.au/procedures/surgical-procedures/breast-reconstruction/

https://www.plasticsurgery.org/news/press-releases/good-long-term-quality-of-life-after-diep-flap-breast-reconstruction

https://www.canceraustralia.gov.au/affected-cancer/cancer-types/breast-cancer/what-expect-diep-flap-breast-reconstruction

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