PRE-READING COURSE MATERIAL
FOUNDATION BOTOX® AND DERMAL FILLERS
Module 2
OVERVIEW

- Principles of Botulinum toxin- constituting products, injection sites and techniques, indications, contraindications and complications
- Principles of dermal fillers- constituting products, injection sites and techniques, indications, contraindications and complications
- Shopping list
• Principles of Botulinum toxin- constituting products, injection sites and techniques, indications, contraindications and complications

• Principles of dermal fillers- constituting products, injection sites and techniques, indications, contraindications and complications

• Shopping list
Botulinum toxin is a neurotoxin produced by the anaerobic bacterium *Clostridium Botulinum*. The neurotoxin is used to treat a wide variety of medical and surgical conditions from cerebral palsy and headaches to strabismus and hemifacial spasm. In 2002, the FDA granted approval for the use of Botulinum toxin A in the cosmetic reduction of glabella frown lines. It has since been used to treat over 11 million cosmetic clients. To date, Botulinum toxin injections remain the most popular non-invasive cosmetic procedure worldwide.

The increasing share of Botox® sales on the cosmetic market from 2003 to 2006 (courtesy of Allergan)

The top 5 cosmetic procedures in the United States in 2015

- Botulinum Toxin Type A (including Botox and Dysport): 4,267,038
- Hyaluronic Acid (including Juvederm, Perlane/Restylane, Belotero, Prevelle, Elevess): 2,148,326
- Hair Removal (laser or pulsed light): 1,136,834
- Chemical peel: 603,305
- Microdermabrasion: 557,690

Botulinum toxin inhibits transmission across cholinergic neuromuscular junctions (NMJ) by interfering with the release of acetylcholine. The toxin proteolytically cleaves the SNAP-25 protein which is needed for the exocytosis of Acetylcholine. The resulting effect is a temporary paralysis of the target muscles, which takes effect within 72 hours. Cholinergic re-innervation at the NMJ occurs through new nerve sprouting which takes 3-4 months.

Indications for Use in the Aesthetic Client:

- Eliminate or reduce dynamic facial wrinkles
- Soften static wrinkles
- Create a ‘lift’

The 3 commonest treatment zones for Botulinum toxin injections
Absolute Contra-indications:
• Aged under 18 years
• Known hypersensitivity to Botulinum toxin or any components within the chosen formulation
• Neuromuscular disorders e.g. myasthenia gravis, Eaton Lambert syndrome
• Active infection at the proposed treatment sites
• Pregnancy
• Breast-feeding
• Clients taking muscle relaxants, aminoglycosides and other agents that may interfere with neuromuscular transmission

Cautions:
• Skin disorders
• Bleeding disorders
• Anti-coagulant / anti-platelet medication
• Excessive weakness or atrophy of the target muscles
• Unrealistic expectations, body dysmorphia
• Concomitant Botulinum toxin treatment
BOTOX® Cosmetic (onabotulinumtoxinA)

**Dilution | Reconstitution | Injection technique**

Help give your patients results that last up to 4 months—physician-reported response of 25% (102/403) vs 2% (2/128) for placebo.

Reconstitute and inject BOTOX® Cosmetic at the recommended dilution ratio. 1

**BOTOX® Cosmetic dilution table**

<table>
<thead>
<tr>
<th>Dilution Instructions for BOTOX® Cosmetic</th>
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</thead>
<tbody>
<tr>
<td>Diluent Added</td>
</tr>
<tr>
<td>(0.9% sodium chloride injection)</td>
</tr>
<tr>
<td>50-Unit vial</td>
</tr>
<tr>
<td>100-Unit vial</td>
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</tbody>
</table>

*Approved dose is 4 Units per 0.1 mL, at each of the injection sites, for a total dose of 20 Units per 0.5 mL.

**Reconstitution**

1. Always confirm you have received the appropriate dose.
2. Using an appropriate-sized needle and syringe, draw up the required amount of BOTOX® Cosmetic.
3. Insert the needle and slowly inject the saline

**Important Information**

Indication

BOTOX® Cosmetic for injection is indicated for the temporary improvement in the appearance of moderate to severe glabellar lines associated with corrugator and/or procerus muscle activity in adult patients ≤ 65 years of age.

**Important Safety Information, Including Boxed Warning**

**WARNING: DISTANT SPREAD OF TOXIN EFFECT**

Postmarketing reports indicate that the effects of BOTOX® Cosmetic and all botulinum toxin products may spread from the area of injection to produce symptoms consistent with botulinum toxin effects. These may include asthenia, generalized muscle weakness, diplopia, ptosis, dysphagia, dysphonia, dysarthria, urinary incontinence and breathing difficulties. These symptoms have been reported hours to weeks after injection. Swallowing and breathing difficulties can be life threatening and there have been reports of death. The risk of symptoms is probably greatest in children treated for spasticity but symptoms can also occur in adults treated for spasticity and other conditions, particularly in those patients who have an underlying condition that would predispose them to these symptoms.

In unapproved uses, including spasticity in children, and in approved indications, cases
Technical Tips:
• Pre-fill the syringes with air to facilitate drawing up Saline / product
• Be aware that the vacuum in the vial will draw the saline into the space very quickly, creating bubbles. Pre-empt this effect and control flow of saline into the vial when introducing the needle
• Avoid vigorous shaking. Gentle rotation of the vial will help prevent bubbles
• If no vacuum is present in a new vial, do not use the product and contact the supplier directly

Method of Administration:
• Position the client in a semi-upright position on the examination table and ensure you have appropriate lighting
• Cleanse the target areas of the face using a non-alcohol cleanser
• Apply EMLA cream to the target areas as needed 20 minutes prior to treatment
• Mark out the injection sites as guided by the client’s activity lines
• Using the hand positioning and administration guides below, deliver the product into the target areas
• Throughout the procedure, treat any bleeding points with moist gauze / cotton pads and light pressure
• Remain receptive and aware, allowing the patient any rest breaks they desire and providing any reassurance needed
• Provide all aftercare instructions as detailed below, including contact details to arrange follow-up appointments
Hand Positioning Tips:
• Use your non-dominant thumb to protect the orbital rim
• Rest your injecting hand against the non-dominant hand or on the client’s face using the little finger / ulnar border for optimal control and accuracy
• Resting the syringe itself on your non-dominant hand for additional control

Injection Technique:
• Proceed through the injection sites systematically to avoid missing / over treating areas
• Identify and avoid any visible blood vessels, reducing the chance of significant bruising
• Use a 30 gauge 1-inch needle
• Inject in a slow and steady manner to ensure accuracy and avoid discomfort
• Inject at an angle of 45 degrees, allowing for downwards spread of product by 2mm and maintaining superficial administration
• Inject with the bevel of the needle facing upwards
Forehead Region– Standard Injection Sites and Dosing Regimen
Forehead Region – Injection Sites:
Typically 5 injection sites are marked out across the width of the frontalis muscle. These may be in line or follow a zig-zag pattern depending on the client. Remember to avoid the aponeurosis.

Forehead Region – Treatment Tips:
• Keep injections superficial when treating the frontalis muscle
• Keeping the angulation of the needle at 45 degrees will facilitate superficial administration of the product
• Avoid injecting the fibrous frontalis aponeurosis as the product will have no effect in this zone
• Injection sites can be tailored to suit each individual client. Alternative patterns include 2 horizontal lines of injection sites and a zig zagging technique.
Glabella Zone – Standard Injection Sites and Dosing Regimen
Glabella Zone – Injection sites:
1. Procerus (deep, central)
2. Medial aspect of corrugator supercilii (deep)
3. Lateral aspect of corrugator supercilii (superficial)

Glabella Zone – Treatment Tips:
• Be mindful of avoiding injections near levator palpebrae superioris
• Do not inject Botox® within 1cm above the medial aspect of the eyebrow
• Position lateral corrugator injections at least 1cm above the supraorbital ridge
• Keep the needle bevel upward facing and away from the orbital rim
• This approach will help clinicians avoid inducing a ptosis
Crows Feet – Standard Injection Sites and Dosing Regimen
Crows Feet – Injection Sites and Treatment Tips:

- Mark out the central site at least 1.5cm lateral to the lateral canthus and ensure the site is lateral to the bony orbital rim.
- Mark out the upper and lower sites 1.5cm above and below the central site. These sites may be at an angle of up to 30 degrees to the central site but must remain lateral to the bony orbital rim.
- Ensure that the most medial injection sites are still lateral to the lateral canthus.
- When injecting in the crow’s feet region keep the needle bevel tip up and the needle orientated away from the eye to avoid injury.
Aftercare Instructions:

• Reiterate the potential for slight bruising and discomfort around the injection sites. The client should seek medical attention in the event of any major concerns.
• Advise the client not lie down, fall asleep or rub / massage the treated areas for at least 4 hours after treatment.
• Gently exercising the muscles that have been treated (i.e. frowning / smiling) can help to activate the toxin and expedite results.
• Clients should avoid consuming alcohol or wearing makeup for at least 24 hours after treatment.
• Advise the patient that the effects can take up to a few days to become apparent.
• Clients should be provided with your contact details in the event of wanting a follow up assessment / further treatment.
Adverse Effects:

- Anaphylaxis (see treatment algorithm on next slide)
- Haematoma
- Pain at the injection sites
- Headache
- Ptosis (3%)
- Eyelid oedema (1%)
- Diplopia
- Hyperactivity of local antagonist muscles

Clients should be informed of the potential risk for distant spread of Botulinum toxin away from the injection sites which could theoretically result in life threatening swallowing or breathing difficulties. Clients should also be informed, however, that to date there have been no reports of death following cosmetic administration of Botulinum toxin.

ANAPHYLAXIS ALGORITHM

Anaphylaxis algorithm

- Anaphylactic reaction?

Airway, Breathing, Circulation, Disability, Exposure

Diagnosis - look for:
- Acute onset of illness
- Life-threatening Airway and/or Breathing and/or Circulation problems
- And usually skin changes

- Call for help
  - Lie patient flat
  - Raise patient’s legs

Adrenaline

When skills and equipment available:
- Establish airway
- High flow oxygen
- IV fluid challenge
- Chlorphenamine
- Hydrocortisone

Monitor:
- Pulse oximetry
- ECG
- Blood pressure

1. Life-threatening problems:
   - Airway: swelling, hoarseness, stridor
   - Breathing: rapid breathing, wheeze, fatigue, cyanosis, SpO2 < 92%, confusion
   - Circulation: pale, clammy, low blood pressure, faintness, drowsy/coma

2. Adrenaline (give IM unless experienced with IV adrenaline)
   - IM doses of 1:1000 adrenaline (repeat after 5 min if no better)
     - Adult: 500 micrograms IM (0.5 mL)
     - Child more than 12 years: 500 micrograms IM (0.5 mL)
     - Child 6-12 years: 300 micrograms IM (0.3 mL)
     - Child less than 6 years: 150 micrograms IM (0.15 mL)
   - Adrenaline IV to be given only by experienced specialists
   - Titrated: Adults 50 micrograms; Children 1 microgram/kg

3. IV fluid challenge:
   - Adult: 500 – 1000 mL
   - Child: crystalloid 20 mL/kg
   - Stop IV colloid if this might be the cause of anaphylaxis

4. Chlorphenamine (IM or slow IV)
   - Adult or child more than 12 years: 10 mg
   - Child 6-12 years: 5 mg
   - Child 6 months to 6 years: 2.5 mg
   - Child less than 6 months: 250 micrograms/kg

5. Hydrocortisone (IM or slow IV)
   - Adult or child more than 12 years: 200 mg
   - Child 6-12 years: 100 mg
   - Child 6 months to 6 years: 50 mg
   - Child less than 6 months: 25 mg
Key Manufacturers and Products:

There are a range of Botulinum toxin products available on the market today. Each product should be considered a unique drug with its own instruction manual. The different preparations need to be measured, administered and stored in different ways and the aesthetic practitioner needs to be aware of this.

- Allergan - Botox®
- Merz - Xeomin
- Galderma - Dysport
- Allergan - Vistabel
- Merz - Bocouture
- Galderma - Azzalure
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• Shopping list
DERMAL FILLERS – INTRODUCTION

- Dermal fillers are injectable materials used to reduce wrinkles and treat deficits in facial volume.
- Products work to mitigate the signs of ageing and improve facial contouring, ultimately providing long-term facial aesthetic enhancement.
- Hyaluronic acid (HA) fillers are the most widely used type of dermal filler.
- The cosmetic industry boom has transformed the world of dermal fillers.
- The popularity of dermal fillers can be attributed to the quick, reliable and long-lasting cosmetic enhancement achieved with minimal downtime and minimal invasiveness.

Cosmetic surgery: obsession and addiction

In the old days we had tupperware parties, now we have botox parties

Kylie Jenner lip filler confession leads to 70% increase in enquiries for the procedure

Apprentice winner Leah Totton opens first cosmetic surgery clinic... With a little help from Lord Sugar and Karren Brady

I looked like I was ageing: Michelle Heaton opens up about having facial fillers

Welcome to Miss Cosmetic Surgery UK where the £3k prize is chance to go under surgeons' knife... yet again.

SO THAT'S HOW SHE DOES IT! Christie Brinkley reveals secret to looking sensational at 62... she has Botox in her NECK

The supermodel spilled the beans on how the procedure helps her stay looking youthful.

Botox can smooth out your depression

Pfizer-Allergan takeover valued at record $160bn healthcare deal
Hyaluronic acid (HA) is a naturally occurring component of human soft tissue.

Therefore, there is no need for allergy testing prior to treatment.

Differences in HA concentration, cross-linking technology, hydration, viscosity, gel properties and longevity alter the mechanical behaviour of the product.

The affinity of HA to water helps replace age related volume loss.

The nature of dermal fillers also allows for incremental administration, giving the client a sense of control and security.
DERMAL FILLERS – INDICATIONS

- Reducing wrinkles
- Correcting deep nasolabial folds and marionette lines (A and B on diagram)
- Correcting age related volume loss in the cheeks and chin, for example
- Firming the skin
- Enhancing facial contours
- Lip definition (E)

A – Nasolabial folds; B – Marionette lines; C – Vertical lip lines; D – Chin wrinkles; E Lip augmentation; F – Deep glabellar lines; G – Temporal hollows; H – Cheek augmentation; I – Orbital rim; J – Nose augmentation
This photo series demonstrates how the use of Juvaderm® XC dermal fillers can improve the appearance of facial rhytids over time.
The key to dermal fillers is to deposit the material at the correct depth and using the correct volume. This is determined by the product used (viscosity) and the area / problem being treated.

- If dermal fillers are injected at too great a depth, the client will be left with unnoticeable and disappointing results.
- If injections are too superficial, you may create undesirable lumpiness or granuloma formation.
- By altering the angulation of your needle you can adjust the depth of administration.
- As a general rule, you should be able to visualise the outline of the needle under the skin but not its grey colour.
Techniques of delivery vary depending on the indication, site, product and experience and preference of the injector. Techniques include:

- Linear threading
- Serial puncture
- Fanning
- Cross-hatching
- Depot
- Fern
- Cone
The linear threading method – the product is deposited in a linear fashion as the needle is steadily withdrawn. This is the most commonly used method.

Serial puncture technique – deeper deposition of droplets of product with serial injections along a wrinkle. This technique may be used to correct deep glabella creases.

Fanning technique – the product is deposited immediately deep to the dermis through a series of small linear threads by passing advancing and withdrawing the needle back and forth to treat the area of concern. The product is deposited as the needle is withdrawn.
Nasolabial Folds:
The nasolabial folds (also known as laughter lines) occur between the cheeks and the upper lip and can become more pronounced with ageing. Dermal fillers can be used to replace volume into these folds and reduce their appearance.

The Technique:
• Treat the folds in a ‘top down’ approach
• Inject the length of the folds using the linear threading technique
• Inject at the corners of the notes using the fanning technique
• Use bleeding points to determine the subsequent end points for the needle
• Remember to massage the treated areas to prevent lumpiness
Marionette Lines:
These are the wrinkles that extend downwards from the corners of the mouth, separating the cheeks from the chin. Marionette lines become more pronounced with age and can result in a downturned and depressed look.

- When treating the marionette lines, use a combination of linear threading, cross-hatching and ferning to elevate and support the skin
- Assess the lines in both the relaxed and dynamic state
- Be mindful of symmetry
- Massage the areas after treatment to prevent lumpiness
Lip Augmentation:
Today, a plump and full look to the lips is considered attractive and desirable but not all of us were gifted with this look naturally the process of ageing can often reduce the volume of the lips.

Treatment objectives:
• Natural fullness
• Well-defined vermilion border and cupids bow
• Good projection
• Smooth and soft appearance
• Balance between upper and lower lips (ideally 7:10)
Lip Augmentation - Technique:

- Focus your volume replacing injections to the middle $2/3^{\text{rd}}$ upper lip and middle $1/3^{\text{rd}}$ lower lip. Be mindful of symmetry and keep track of how much product you have used on each side.
- When treating the vermillion border, start by advancing the tip of the needle to the corner of cupids bow on one side. Inject using the linear threading technique as described previously. Use the puncture mark to define the end position of the needle in subsequent injections to ensure a smooth and even distribution of product. Injections along the vermillion border should be superficial.
- Aim to achieve a ratio of 7:10 upper:lower lip volume wherever possible.
- Treat any bruising with brisk and firm pressure using cotton wool / gauze.
- If treating the central portion of the upper lip, ensure that the corners of cupids bow remain prominent and defined and inline with the philtrum columns.
- Massage the lips after treatment to help evenly distribute the product and prevent lumpiness.
Contraindications:
- Allergy to any component of dermal fillers
- A history of severe allergy defined as an anaphylactic response or the presence of multiple severe allergies
- Allergy to gram-positive bacterial proteins
- Allergy to Lidocaine
- Active infection at the proposed treatment site
- Clients under the age of 21

Cautions:
- Do not inject into blood vessel. Intravascular spread of these products can cause embolization, thrombosis, ischaemia and infarction of local or distant tissues
- Do not use at sites which are actively affected by inflammatory skin disorders
- Do not use if there is a history of keloid or hypertrophic scarring
- Pregnant women
- Breast-feeding
- Patients receiving immunosuppressive therapy
- Patients with bleeding disorders or a tendency to bruise easily
- Recent laser treatment, chemical peel or other therapy that induces an active dermal response
DERMAL FILLERS– CORE PRINCIPLES

Common Side Effects:
Temporary redness, swelling and tenderness
Temporary lumps or bumps
Bruising
Temporary itching

Uncommon Adverse Effects:
• Intravascular spread of the product can cause embolization, thrombosis, ischaemic and infarction. This can result in temporary or permanent visual impairment, blindness, stroke. Although rare, it is important to educate clients about this risk to facilitate informed decision making
• Damage to local tissue including discolouration, soft tissue necrosis, abscess formation, granulomatous change and hypersensitivity have been reported
• Infection
• Late onset nodule formation

Compliance with the contra-indications and cautions to treatment as stated by the manufacturer will help practitioners avoid adverse reactions. Adequate training is also vital to ensuring against inappropriate or superficial placement of product, which accounts for the majority of adverse reactions.
Key Manufacturers and Products:

- Allergan - Juvederm
- Galderma - Emervel
- Galderma - Restalyne
- Merz - Belotero
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- Shopping list
When starting your own practice, ensure you have the necessary consumables. We have made a shopping list for you…

<table>
<thead>
<tr>
<th>Item</th>
<th>Item</th>
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</thead>
<tbody>
<tr>
<td>1ml and 2ml syringes</td>
<td>Mini fridge to store products</td>
</tr>
<tr>
<td>21G and 30G needles</td>
<td>Ice packs</td>
</tr>
<tr>
<td>0.99% bacteriostatic saline</td>
<td>Hand held mirror</td>
</tr>
<tr>
<td>Cleansing wipes/ sterets</td>
<td>Camera</td>
</tr>
<tr>
<td>Gauze</td>
<td>Medical record forms</td>
</tr>
<tr>
<td>Disposable kidney dish</td>
<td>Consent forms</td>
</tr>
<tr>
<td>Emla cream</td>
<td>Hair band</td>
</tr>
<tr>
<td>Gloves</td>
<td>White makeup pencil</td>
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