Facial Reanimation (updated 06/06)

SW1. Review the anatomy of the facial nerve.

SW2. Review the microscopic anatomy of a motor nerve (axons, epineurium, etc.).

SW3. Sunderland classification of nerve injury (schematic drawings would help). What are the estimated spontaneous recovery times?

   Physical Therapy
   Botox – for synkinesis

Neural Procedures:
-Nerve crossover procedures are a secondary consideration, with variations of XII–VII most commonly in use today. Cross-facial nerve grafting is another consideration, but this technique without free-muscle transplantation has largely been abandoned due to poor results.
-Extratemporal Neurorrhaphy
-Intracranial and Intratemporal Neurorrhaphy
-Cross Face Grafting: sural grafts used to anastomose to zygomatic and buccal branches of contralateral side
-Cable Grafting: interposition facial nerve grafting, Greater auricular nerve used for length < 10 cm, Sural nerve graft used for length of 10-35 cm
-Nerve Crossover: XII-VII, other cranial nerves Several cranial nerves have been utilized for nerve crossover, including trigeminal, glossopharyngeal, and phrenic, all of which have been abandoned.75 The crossover techniques that remain in clinical use include XII-VII, XII-VII jump graft, and, rarely, XIVII (Figs. 53–8 to 53–10). These techniques, of which XII-VII and XII–VII jump graft have been the most popular,75 remain a dependable and effective treatment for situations in which the proximal facial nerve is unavailable but the distal nerve remains anatomically intact. Advantages include relatively low degree of technical difficulty, relative short time to movement (usually 4 to 6 months), one anastomotic suture line (as opposed to cable grafting with two), and motion that can resemble mimetic function with practice (Fig. 53–11). Disadvantages of all crossover techniques include donor site morbidity and some degree of mass movement.
The major problem specific to XII-VII crossover is the paralysis of the ipsilateral tongue musculature, which can result in significant speech, mastication, and swallowing difficulties. In one study, more than 15% of patients complained of these difficulties.76 Although most patients can tolerate such deficits without significant morbidity, they can be incapacitating for patients who may develop other cranial nerve deficits—particularly those who may be at risk for tenth or contralateral twelfth cranial nerve loss. In these patients, another cranial nerve, such as the spinal accessory, or the XI–VII jump graft, or the XI–VII (eliminates risk to cranial nerve XII), offers an alternative that can spare the morbidity of sacrificing the twelfth nerve.64,74,7
Dynamic Reanimation: Transposition of temporalis or masseter muscle
Static Rehabilitation: tensor fascia lata as sling material, allograft
Microvascular free tissue transfer

AA5. Discuss the management of the eye in facial paralysis, include surgical procedures.
Of greatest concern to the facial plastic surgeon are the potentially devastating ophthalmologic consequences, such as exposure keratitis and corneal ulceration, leading to decreasing visual acuity and potentially to blindness. The fundamental deficits are loss of the blink response and incomplete eye closure. The primary goal in ocular rehabilitation is to protect the cornea from these sight-threatening complications.

Medical Management: Regular ocular lubrication (tears contain antimicrobial substances, IgA), Artificial tears 5-10x/day, Ophthalmic ointment at night.
-Moisture chamber and taping – used in addition to drops and ointment, useful when Pt is outdoors 
-Ophthalmology referral

Surgical Management:
Techniques include tarsorrhaphy as well as use of Silastic or wire-spring implants, gold weights, magnets, ear cartilage grafts, and various muscle-tendon slings or grafts. Reanimation may require surgery on the upper eyelid alone or on the lower lid as well. The method of “dual reanimation,” or addressing the eye and the mouth with independent surgical procedures, provides the best functional and cosmetic results.

Upper Eyelid:
-Platinum chain implant, w or w/o fascia or allograft barrier - for poor blink, 2-3 mm lagophthalmos, favorable globe position
-Minitemporal transfer – poor corneal sensation, absence bell phenomenon, poor blink, negative vector globe
-Levator advancement or plication – Blepharoptosis secondary to aberrant facial nerve regeneration

Lower Eyelid:
-Lower eyelid vertical suspension with spacer graft – ectropion with > 2-3 mm scleral show
-Lower eyelid fascial sling suspension – ectropion, patient with medial and lateral canthal tendon laxity, lacrimal punctum eversion
-Medial canthopexy – medial canthal laxity, medial eyelid marginal eversion, lacrimal punctum displaced away from globe, lacrimal punctum can be distractly laterally past the medial limbus
-Lateral canthopexy – lateral canthal laxity, used in combination with medial canthopexy
-Tarsal strip, canthal tightening – extreme canthal laxity in elderly patients
-Direct neurotization of orbicularis oculi muscle (jump graft from ipsilateral facial nerve stump or hypoglossal nerve) – presence of fibrillation potential on EMG, resected or unidentifiable ipsilateral facial nerve branch to orbicularis, young or middle aged patient

AA6. What is Bell’s phenomenon?
Bell's phenomenon is a medical sign that allows observers to notice an upward and outward movement of the eye, when an attempt is made to close the eyes. The upward movement of the eye is present in the majority of the population, and is a defensive mechanism. The phenomenon is named after the Scottish anatomist, surgeon, and physiologist Charles Bell. Bell's phenomenon is a normal defence reflex present in about 75% of the population, resulting in elevation of the globes when blinking or when threatened (e.g. when an attempt is made to touch a patient's cornea). It becomes noticeable only when the orbicularis oculi muscle becomes weak as in, for example, bilateral facial palsy associated with Guillain-Barré syndrome. It is, however, present behind forcibly closed eyelids in most healthy people and should not be regarded as a pathognomonic sign.

CB8. Nerve transposition. When and which nerves?

TT9. Muscle transfer. When and which muscles?