



VIRTUAL MEDICAL GRAND ROUNDS

Wednesday 21 July, 2021 – 12.30pm to 1.30pm

Presentation 1:

**Spinal cord electrical stimulation:
Can it improve walking ability in people with SCI?
eWalk Trial-Introduction**

Presenters:

**Dr Claire Boswell-Ruys and Dr Elizabeth Bye
Research Fellows, Physiotherapists, Neuroscience Research Australia**

Presentation 2:

Fitness to Fly: Rehab Perspective

Presenter:

Dr Feng Liang, Rehabilitation Registrar

VIA ZOOM:

<https://us02web.zoom.us/j/81522893657?pwd=bW9CTTNZVVVGWnJTR2c0c2E2ZHNhQT09>

Questions can be submitted during the event using Zoom Chat

Spinal Rehabilitation Medicine

A photograph showing the wing of an airplane in flight, viewed from a passenger's perspective. The wing is white and extends from the bottom right towards the center of the frame. Below the wing, a vast expanse of white, fluffy clouds stretches across the horizon. The sky above is a pale, hazy blue. The overall scene is serene and captures the experience of flying through a cloudy sky.

Flying with Spinal Cord Injury

Introduction

- Case introduction
- Considerations:
 - Functional status
 - Equipment access
 - Personal care (continence, pressure relief)
- How Mr JC runs his trip

Mr JC

- 37 yo male
- C2 complete spinal cord injury in 2007 after sporting accident
- Receives funding for services and equipment through NDIS/ENABLE
- Works as event manager that involves regular travel to Philippines and Japan (event promotion, selling tickets, staff recruitment etc.)



Functional status

- Respiratory support 24/7
 - Phrenic nerve pacer day time
 - Mechanically ventilated through tracheostomy at night time
- Communicates while using phrenic nerve pacer
- Tilt in space PWC with chin + attendant control
- Hoist transfer
- Nil swallowing issues but needs assistance for feeding
- SPC for bladder emptying
- Stoma to assist with bowel management
- Intrathecal baclofen pump for spasticity management

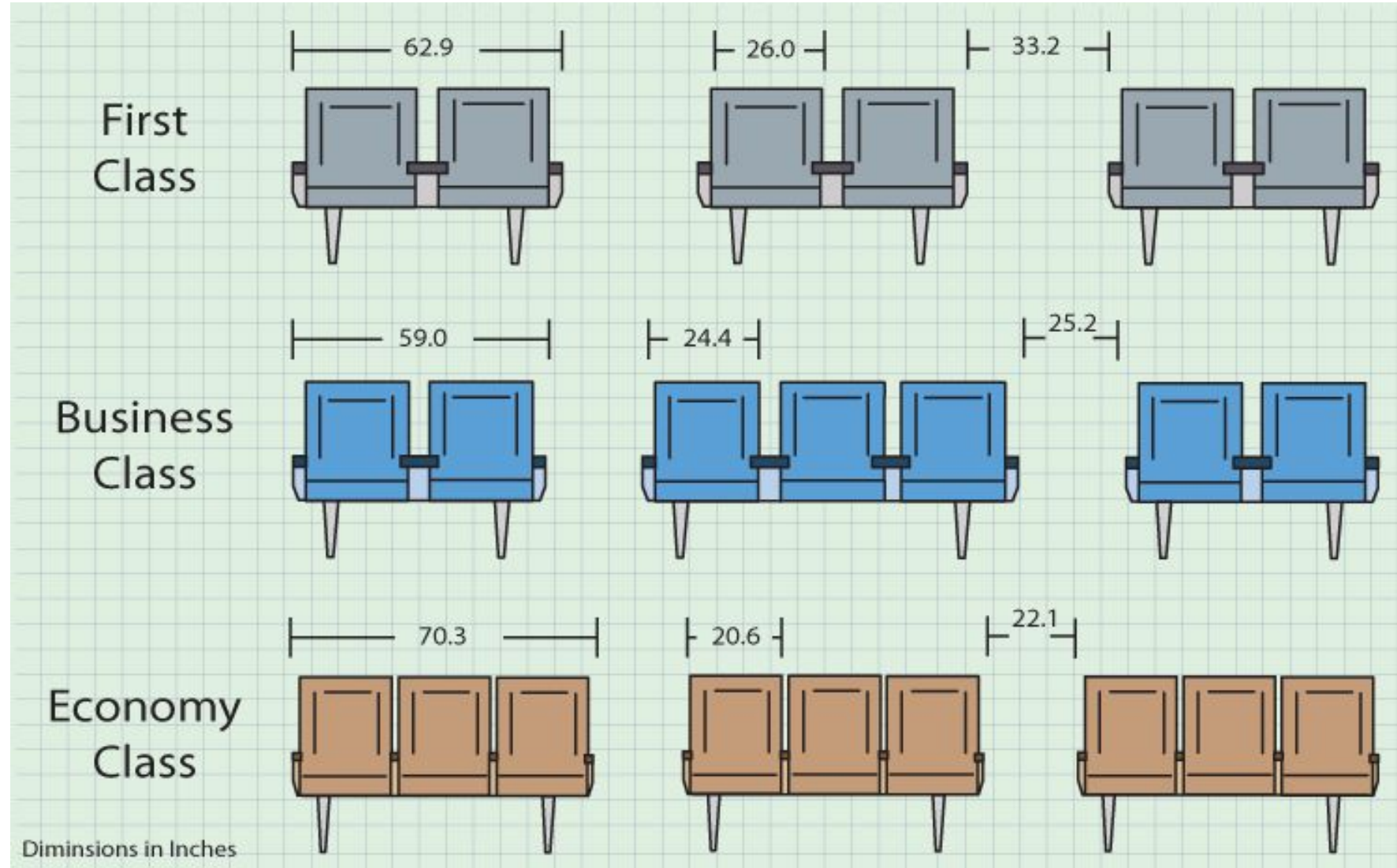
Flight details

- Which airline/s
- Airplane specifications for seating/equipment
- Timing of flight
- Duration of flight/s
- Time between connecting flights
- Departure, transit and arrival airports

Travel support staff

- Travel companion:
 - To assist with feeding, toileting, managing equipment/baggage, and managing administrative processes
- Nursing escort:
 - Provides first aid, medication administration and infusions
- Medical escort:
 - Can provide ICU level care (ventilator dependent)
 - Usually includes a team of paramedics, nurses and physicians

Wheelchair access



Personal wheelchairs



Power wheelchair with chin control

- Cabin generally has only stowage position for one collapsible manual wheelchair – all non-collapsible and power WCs need to be checked
- Battery powered wheelchairs need dangerous goods approval and battery may need to be disconnected

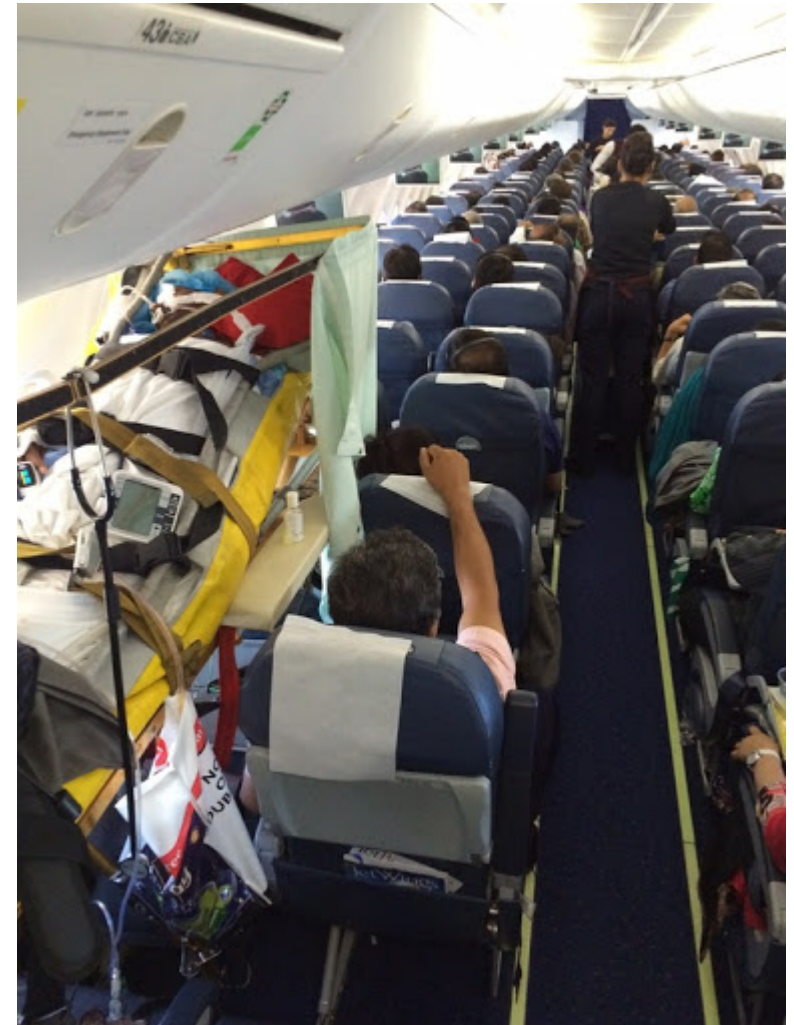
Airport wheelchair

- 2 types, both attendant propelled only:
 - Airport wheelchair: used on ground, max weight 130-160kg
 - Aisle wheelchair: narrower, max weight 135kg



Seating

- Check airline and class for different specs: travel in business vs economy
- Consider:
 - Sitting balance
 - Sitting tolerance: seats will need to be upright for at least 30min at take off and landing
 - Ability to pressure relieve
 - Ease of transferring in/out of seat
 - Is stretcher more appropriate?



Economy stretcher vs business class seat



Transfer equipment

- Airport and airline dependent
 - Eagle Hoist: max 200kg
 - Slide board or slide sling: max 150kg
 - Transfer belt



Pressure relief

- Pressure relieving seat cushion used on plane seat
- For pressure relieving alternates between lying and sitting as less space for other manoeuvres
- Wear loose clothes
- If using air cushion:
 - needs to deflate before take off and recheck pressures on landing

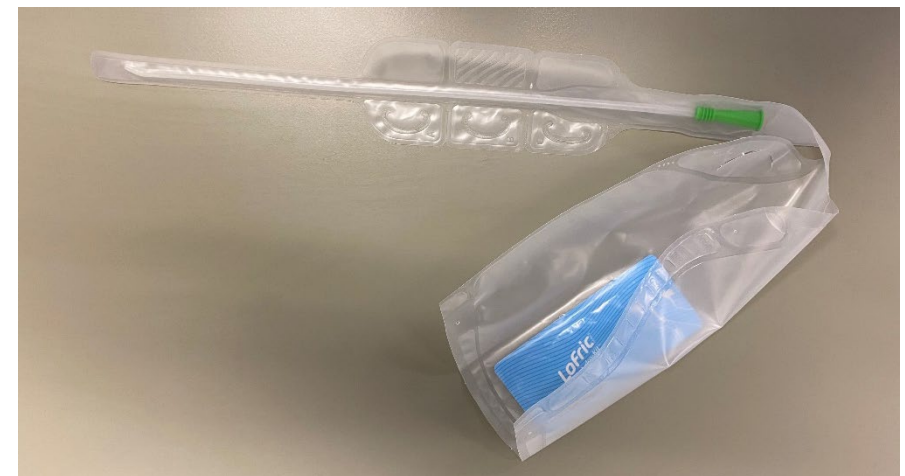


Bowel Care

- Wide bodied aircrafts (A330, A380, B747) have accessible toilets
- Airline crew can transport passenger to toilet door but not assist within the toilet
- Colostomy bags can only be changed within toilets and cabin staff cannot assist
- Consider implementing bowel plan before travel

Bladder care

- Staff cannot assist with emptying, however disposal bags can be provided
- Passengers can self-catheterise discreetly at their seat, and put sealed urine bag or bottle within disposal bag, then give to staff to dispose
- Options:
 - Catheter with collection bag
 - Catheterise and drain into bottle/urine bag
 - IDC or SPC
- Travel certificate to carry continence products



Other medical

- Suggest Clexane 40 mg dose before long flights
- Bloating, blocked catheters or poor positioning can precipitate spasms or autonomic dysreflexia in flight
 - should carry equipment and medications to troubleshoot these

Travel insurance for the travelling quadriplegic

- Essential!
- Disabilities are considered pre-existing conditions
- Call and get personalised quote

Mr JC's Pre-trip organisation

- Organise 2-3 nurses for travel
- Organise travel insurance
- Liaise with airline re: administrative and logistical procedures esp for equipment
- Find out locations of major hospitals at destination city

Pre-flight

- Arrive at airport with power wheelchair which gets checked in
- Transfer to airport wheelchair, then hoist transfer onto business class seat on plane
- Declarations need to be done for batteries, medications, equipment, oxygen
- Uses phrenic nerve stimulator for duration of flight, with back-up oxygen and ventilator on hand if required
- Nurse will give Clexane prior to flight

CHECK WITH THE AIRLINE

Some dangerous goods are permitted provided certain carriage requirements have been met



Ammunition



Avalanche rescue backpack



Batteries (spare)/power banks



Camping stoves



CO2 gas cartridges



Dry ice



Engines (internal combustion)



Heat producing devices



Life jackets (self-inflating)



Mobility aids



Oxygen (for medical use)



Power tools

FREIGHT ONLY

These are not permitted in carry-on or checked baggage but can be sent as dangerous goods freight.

Lithium ion batteries exceeding 160Wh



Non-spillable batteries exceeding 12V and 100Wh



Note: Irrespective of the battery Watt hour (Wh) rating, all self-balancing boards must be sent as dangerous goods freight.

CARRY-ON BAGGAGE ONLY

All battery terminals must be protected

Lithium ion batteries — not more than 100Wh (rechargeable)



Lithium ion batteries — exceeding 100Wh up to 160Wh (rechargeable)

Note: Only two spares per passenger are permitted and operator [airline] approval is required



Non-spillable batteries e.g. sealed lead acid, dry cell etc. — not exceeding 12V and 100Wh

Note: Only two spares per passenger are permitted. No operator [airline] approval is required



Others e.g. nickel metal hydride, alkaline, nickel cadmium (Ni-Cd) etc.



Power supply and batteries

- Need to declare capacity, voltage and type of the batteries for clearance and storage in flight
- Some airlines allow the use of onboard electricity (possibly for a fee) through a medical electrical outlet.
- Most airlines allow dry or gel cell batteries onboard if they can fit under the seat.
- Test and confirm the ventilator's internal and/or external battery use time before leaving for the airport and before boarding.

In-flight back-up plan

- Brings onboard:
 - medications + PRNs to manage AD and spasticity
 - BP monitor
 - extra catheters/bags
 - stoma bags
 - trache care kit
 - suction equipment
 - cough machine
 - oxygen cylinder
 - ventilator
 - wipes/cleaning solutions
- RN – trained for inflight emergency management e.g. AD awareness and mx



Post arrival

- Carer picks up PWC and equipment directly from cargo area to avoid rough handling and damage to equipment
- US data: damage rate of ~1.5% in 2019
- Some suggestions:
 - Label the equipment
 - Get it serviced and take pictures prior to flying for proof of original condition
 - Carry a tyre repair kit





Automated External Defibrillator (AED)



The battery-operated AEDs introduced into the JAL Group are portable and can be carried easily. By simply applying the electrode pads to the patient's chest under the automated voice instruction in English and Japanese, the AED automatically analyzes the patient's electrocardiogram. Once ventricular fibrillation is detected, AED gives instruction for defibrillation (pressing the button to pass an electric current). In case the button is pressed by mistake though ventricular fibrillation is not detected, the electrical current will not be released. Additionally, it has been proven that the electrical current produced by this type of AED does not interfere with the aircraft systems, which makes this device safe and highly reliable.

Electrocardiogram monitor

A compact electrocardiogram monitor is included in the AED kit, in order to accurately analyze the patient's condition. Since the monitor is waterproof and impact-resistant, it can be used for CPR or defibrillation.

Principal Onboard Medical Supplies and Equipment

Medical Supplies (in Doctor's Kit)	Medical Instruments
Injections Glucose solution Isotonic Sodium Chloride Adrenaline Dopamine hydrochloride* Hydrocortisone sodium phosphate Scopolamine butylbromide Aminophylline Terbutaline sulfate* Atropine sulfate Methylethergometrine maleate* Furosemide* Lidocaine*	Automated External Defibrillator Compact electrocardiogram monitor Sphygmomanometer Electronic Sphygmomanometer Pulse oximeter Stethoscope Blood Glucose Meter* Nelaton catheter* Suction catheter with trap (for Newborn Baby)* Ambu bag with Reservoir Masks (for adults and children) Laryngoscope set* Endotracheal tube* Bite block/Airway* Injection set
Oral Medication Clemastine fumarate* Nitroglycerin Nifedipine Ofloxacin*	

*Items indicated with an asterisk are only available on international routes (as of February 2016).

References

- Aerospace Medical Association: <https://www.asma.org/publications/medical-publications-for-airline-travel/medical-considerations-for-airline-travel>
- International Air Transport Association: <http://www.iata.org/publications/Pages/medical-manual.aspx>
- Air travel after intracranial surgery: a survey of advice given to patients by consultant neurosurgeons in the UK (2013) Amato-Watkins, A.
- Meta-analysis: Travel and Risk for Venous Thromboembolism (2009) Divay Chandra et al. *Ann Intern Med*.
- Compensatory vasodilatation during hypoxic exercise: mechanisms responsible for matching oxygen supply to demand. (2012) Casey, D.P.J. *Physiol*.
- UpToDate articles:
 - Assessment of adult patient for air travel
 - Travelling with oxygen aboard commercial air carriers
 - High altitude, air travel, and heart disease
 - Pneumothorax and air travel
 - Prevention of venous thromboembolism in adult travellers
- QANTAS medical clearance guidelines: <https://www.qantas.com.au/infodetail/flying/beforeYouTravel/mediform.pdf>
- Qantas disability access facilitation plan <https://www.qantas.com/content/dam/qantas/pdfs/fly/specific-needs/qantas-disability-access-facilitation-plan.pdf>
- JAL medical supplies and equipment onboard: <https://www.jal.co.jp/en/health/medicines/>
- Canadian Transport Agency: <https://otc-cta.gc.ca/eng/publication/accessible-travel-all-everywhere>