

AEROMEDICAL TRANSPORT OF THE PSYCHIATRIC PATIENT
A BRITISH COLUMBIA PERSPECTIVE

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April, 2017

Canada's westernmost province, British Columbia (BC), is a large and geographically diverse region. Nearly 945,000 square kilometres (365,000 square miles) in size, this area corresponds roughly to the size of the Australian states of South Australia or New South Wales. While residents and tourists alike admire the beautiful scenery this province has to offer, our landscape also poses many challenges to the provision of health care and ambulance service.

With the exception of metropolitan areas, much of BC's topography is comprised of mountain ranges, remotely isolated villages, and coastal islands inaccessible by road. Even the larger populated cities may have difficulty in transferring patients to other hospitals by ground ambulance simply due to the great distances between communities. Winter or adverse weather conditions at times will wreak havoc on our highways and completely isolate otherwise accessible areas. Snow, avalanches, flooding and landslides are a few examples of weather related events that can close major highways for days in both alpine and coastal regions at any time of the year.

As of January 1, 2017 the population of British Columbia is estimated at approximately 4.8 million. The majority of residents inhabit the metropolitan areas of Vancouver and Victoria, with other large population centres located throughout the province. Centralisation of specialised health care facilities often necessitates the movement of patients by air ambulance either because there are few other transport options available in a particular area, or simply to reduce out of hospital time compared to that of ground ambulance transportation. This includes patient referrals to tertiary psychiatric facilities, which are also located in larger population areas.

It is because of the above-noted challenges that the BC provincial air ambulance service is often tasked to treat and transport mental health patients with primary psychiatric concerns. Due to the potential risk associated with psychiatric air transport, BC is one of the few jurisdictions in North America where these types of air transports are performed on a regular basis.

Even when it may be technically possible to transport a patient by ground ambulance, excessive travel times may make that option less desirable. Depending on the locations of referring and receiving facilities, transport times by ground could potentially exceed ten to 12 hours, or even longer. The logistical considerations of such an undertaking would likely involve multiple ambulance crews to avoid fatigue, and patient comfort would certainly be compromised.

The more common scenario encountered when transport coordinators are deciding between air or ground transport is a four to 6-hour transport time by road. These transport times are a grey area for any patient transfers of a stable nature. There has recently been more of an effort to avoid air transportation of psychiatric patients in these cases, but the out of hospital time does need to be considered if there is a requirement for sedation. A high-risk patient who requires deeper levels

of sedation may best be managed by flight teams to affect a safe patient transport, and thus would also reduce out of hospital time. Patients of a lower risk category may not require high levels of sedation and transport time is not as much of a concern.

In British Columbia, prehospital and interhospital aeromedical services are provided by the provincial BC Ambulance Service (BCAS). The Critical Care Programs branch of BCAS provides Critical Care Transport (CCT) services to all of BC, with occasional transports into the province of Alberta and the Yukon Territory. CCT may be completed by land, sea and air, but it is the Air Operations in which our transport teams are most utilized and recognized. With flight bases located in several major centres, the CCT dedicated aircraft fleet currently consists of four Beechcraft King Air 350 turboprop planes, one Cessna Citation Encore jet, and four helicopters. (Each aircraft type also includes a number of spare units that are not typically staffed to compliment the duty fleet unless specifically requested for special circumstances).

CCT teams in British Columbia are comprised of Critical Care Paramedics (CCP). High-risk neonatal and maternity transports are also part of the mandate of Critical Care Programs, and CCT crews with specialised training for these patient categories are utilized. Crew configuration, regardless of mode of transport, is a CCP/CCP model, with two pilots in each aircraft at all times.

In the context of psychiatric transports in BC, it should be noted that helicopters are usually not used for these response types. Rotor wing aircraft are generally reserved for scene responses and high acuity medical transports within their operational areas. Psychiatric air transports are therefore normally done in one of the five available fixed-wing aircraft.

When a sending facility initiates the request for psychiatric transfer, processes are followed to assure that the patient gets the care they need while also mitigating undue risk to flight crews. It is accepted that patients with primary psychiatric disorders fall into a spectrum of risk, from “Low” to “Ultra High Risk” and a risk stratification tool is used to determine where on this spectrum a patient may be at the time the request for transport is made, and within 24 hours of the transport being initiated.

Physicians who are involved in the BC Critical Care Transport program as educators and advisors have developed the risk stratification tool presently used in this province. It is employed by a small group of empaneled psychiatrists to assess the potential for risk of each psychiatric air transport request. If this risk stratification was done greater than 24 hours prior to transport, or if an alternate assessment tool was used, then the process will start again to ensure that this uniform approach to risk stratification is adhered to.

Prior to a psychiatric air transport, a teleconference is established between the CCP crew assigned to the response, a transport advisor physician, the referring psychiatrist, air ambulance dispatchers, and call centre staff involved in coordinating the referral.

During this teleconference, information is shared regarding patient medical and psychiatric history, reason for referral, risk stratification scoring (Low, Moderate, High, or Ultra High Risk), any patient propensity for violence, aggression, agitation or anxiety, and whether the patient is a voluntary admission or involuntarily certified under the Mental Health Act. A sedation strategy is then discussed and agreed upon to affect safe air transport for this particular patient, and requirement for physical restraints is determined.

(Note that due to the nature of mental health transport to a higher level of care, most psychiatric patients transported by air in BC have been certified by a physician under the Mental Health Act. This affords health care providers the ability to physically restrain and sedate patients as deemed necessary. If they are not certified, and a risk stratification has not been completed, they are managed as “High Risk” for the safety of all involved).

A brief explanation may be in order regarding the standard use of sedation when transporting patients with primary psychiatric disorders by air.

The air ambulance transport environment immerses patients in stimuli that may be agitating and uncomfortable. Little can be done to mitigate much of the stimulation that patients are subjected to while being transported by air. Noise, constant motion, vibration and turbulence, all while positioned on a stretcher and facing backwards in the aircraft, may potentially contribute to an increase in agitation and anxiety.

There have been cases in British Columbia of flight crews suffering physical injury while attempting to restrain and sedate patients in flight who had become acutely agitated. It goes without saying that if any member of the flight team were to become incapacitated by an aggressive patient, the possibility of an aircraft disaster becomes very real. There is no option to simply pull over and open the doors when flying at 25,000 feet. Sedation strategies (and physical restraints, if required) are employed to ensure that psychiatric patients are transported as comfortably as possible for their own benefit, and also for the safety of the entire flight team.

The Richmond Agitation and Sedation Scale (RASS) is widely utilised throughout BC in most health care facilities and by all CCP teams to determine a patient's level of sedation. A desired RASS score to be maintained throughout transport is ascertained in relation to a patient's level of risk.

Richmond Agitation and Sedation Scale

- +4: Combative (Violent; Immediate Danger)**
- +3: Very Agitated (Pulls lines/tubes; Aggressive)**
- +2: Agitated (Frequent non-purposeful movement; Fights ventilator)**
- +1: Restless (Anxious but movement is not aggressive or vigorous)**

- 0: Alert and Calm**

- 1: Drowsy (Not fully alert but sustained periods of waking)**
- 2: Light Sedation (Briefly awakens with eye contact to voice)**
- 3: Moderate Sedation (Response to voice; No eye contact)**
- 4: Deep Sedation (Movement/Eye Opening to physical stimulation)**
- 5: Unarousable (No response to physical or verbal stimulation)**

Where a "Low Risk" patient may be safely transported with a desired RASS score of zero to -1, "Ultra High Risk" patients may necessitate physical restraints and a RASS score of -5 for safety. The spectrum of risk, coupled with the spectrum of sedation level, will determine how patients are managed prior to transfer and during air transport.

Generally speaking, unless there are specific concerns, "Low Risk" patients may not require physical restraints and will probably be transported comfortably with pre-flight oral administration of an anxiolytic and antiemetic, such as lorazepam and dimenhydrinate. Making sure the patient uses the toilet prior to transport and application of a nicotine patch, if necessary, are also helpful steps in keeping patients comfortable while flying. These patients may often be transported to the flight team by local ambulance unless an in-hospital assessment is desired by the transport team to ensure that pre-flight requirements are adequate.

"Moderate", "High", and "Ultra High Risk" categorised patients typically will require sedation consistent with a RASS score of -2 to -5, depending on the risk level that has been determined. Soft physical restraints will be applied by the CCP crew while at the referring facility prior to initiating transport, and sedation levels will be assessed for adequacy. The "Moderate Risk" patient may be easily managed with pre-transport administration of an antipsychotic medication, if required, such as olanzapine or haloperidol, in addition to the usual anxiolytic and antiemetic. If

further sedation is deemed required to affect safe transport, the CCP may contact their physician transport advisor to discuss an escalation of the sedation strategy. Treatment plans may evolve, and contingency planning for acute agitation may resemble that which is normally reserved for higher risk patients.

The “High” or “Ultra High Risk” patient’s management is likely to begin further along the sedation continuum, with RASS scores of -3 to -5 desired for transport. Although not automatically applied unless its necessity has been predetermined, the prospect of endotracheal intubation and mechanical ventilation is always a possibility. Intubation is generally regarded as the top tier of an escalating treatment plan whenever deeper levels of sedation are required.

When the flight team arrives at the sending hospital, pre-transport medications will normally be taking effect and the crew can safely assess the patient and initiate intravenous access. The patient will be positioned on to the transport stretcher, where monitoring equipment and physical restraints are applied. Desired medications are prepared and infusion pumps are set. Airway management equipment is always readily available as part of the standard CCP gear set on every patient transport.

Standard monitoring of sedated patients by BC aeromedical teams consist of end tidal CO₂ capnography, SpO₂, ECG, and NIBP. Electroencephalogram (EEG) monitoring is utilised by some CCP teams, with likely expansion to all flight crews in the near future.

The choice of pharmacological agents used to achieve sedation varies among individual CCPs. There currently is no standard (protocolised) approach to psychiatric sedation, and medication choices are typically based on personal preference of the practitioner while taking into consideration any underlying medical concerns. Ketamine and Propofol are the two most common medications utilised for psychiatric sedation. Midazolam is no longer as frequently used as it once was due to the availability of better pharmacological options. Both Ketamine and Propofol achieve sedation rapidly, are easily titrated, and allow for faster patient recovery at the completion of the patient transport.

Anecdotally, Ketamine does appear to reduce the number of intubations required for sedated psychiatric patients due to the retention of an intact gag reflex and self-managed airway. Aeromedical services in Australia have published some documented evidence to this effect but to date there have been no similar studies done in British Columbia.

Regardless of the medications chosen to affect sedation, diligent monitoring of the patient’s airway and close attention to monitored values and waveforms is done continuously throughout the transport.

Although mental health patients may be ultimately accepted into tertiary psychiatric facilities for their care, sedated patients are first assessed in an emergency department for medical clearance before being transferred to psychiatry. Depending on the receiving facility, the ED could be located in the same facility or may be in another location. The flight team accompanies the patient to the chosen emergency department and discontinuation of sedation is usually done at this time.

Deeply sedated patients may require an extended period of recovery and monitoring in the ED, while light to moderate levels of sedation may be quickly cleared and moved to their final destination. Patients who have been intubated for transport will be handed over to emergency department staff for discontinuance of sedation and extubation when the available resources are prepared. Once the extubated patient has been medically cleared and is awake, a transfer to psychiatry will occur at that time. Physical restraints will often remain in place until the patient has been received into the care of psychiatric staff at the tertiary facility.

Post script: As best practice continues to be defined in all areas of medicine, the concepts and procedures described here will certainly evolve, as well. It should be noted that mental health emergencies require specialised treatment in the same way that medical emergencies do; therefore, this subgroup of patients requires the same standards of care as any others who are treated and transported in the medical system. Continuing education, review of available literature, and research relevant to psychiatric patient transport will continue to be important building blocks for optimal care of mental health patients.

About the Author

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