

# The Mobile Medical Unit: A unique program in British Columbia

Two well-equipped tractor-trailers and a multidisciplinary team are available 365 days a year to deploy rapidly and provide hospital renovation or special event support, public health outreach, emergency disaster response, and education for health care professionals.

**ABSTRACT:** British Columbia's Mobile Medical Unit originally provided health care support in Whistler as part of the 2010 Vancouver-Whistler Olympic and Paralympic Winter Games. Since being taken over by the Provincial Health Services Authority in 2010, the Mobile Medical Unit has served as a walk-in clinic, emergency department, intensive care unit, obstetric care unit, a classroom with state-of-the-art high-fidelity patient simulators, and a disaster response training centre. Equipment for the unit includes two tractor-trailers, specialized tents and shelters, and a support vehicle. Directed, managed, and staffed by a multidisciplinary team of clinical, operational, and service support personnel, the unit can be mobilized within 24 hours

and is available for deployment anywhere in British Columbia 365 days a year. The unit can be used to provide disaster response services or to maintain continuity of patient care at smaller hospitals facing disruptions because of planned renovations. The unit can also be used to bring primary health care and human resources to remote, isolated, or marginalized communities. The Mobile Medical Unit program collects data on all its missions to optimize efficiency and manage its operational costs, and undertakes research on the economic and social benefits of this unique health care program. Inquiries about the program can be forwarded to the clinical operations director, Mr Peter Hennecke, at [peter.hennecke@phsa.ca](mailto:peter.hennecke@phsa.ca).

**T**he Provincial Health Services Authority (PHSA) Mobile Medical Unit (MMU) is a highly specialized health care delivery system that can be rapidly deployed anywhere in British Columbia to meet a range of needs. Under the direction of the PHSA, the MMU program has a broad-ranging mandate that includes providing support for public health clinics, hospital renovations, primary and secondary disaster response, and related education for health care professionals. Directed, managed, and staffed by a multidisciplinary team of clinical, operational, and service support personnel, the MMU can be mobilized within 24 hours and has been deployed to 30 sites in British Columbia since 2011.<sup>1</sup> Currently, the PHSA MMU is the only program of its kind in Canada.

Dr Vu is associate medical director of the Provincial Health Services Authority Mobile Medical Unit. Mr Hennecke is clinical operations director of the unit. Ms Veenstra served as program operations manager for the unit until June 2015. Ms Betts is the program assistant for the unit. Mr Gardner served as manager of Facilities and Deployment until June 2014 and is now support manager for Facilities. Dr Flesher is medical director of the unit.

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## History of MMU

The equipment for the MMU was originally purchased to support the health care infrastructure in Whistler during the 2010 Vancouver-Whistler Olympic and Paralympic Winter Games. In addition to the pre-existing Whistler Health Care Centre that provided primary care to Whistler residents and the visiting public during the games, additional health care capacity was required for athletes and members of the Olympic family. To address these needs, the Whistler Olympic Polyclinic was opened to provide the complete range of specialized medical services that would be found at any major tertiary care hospital. The MMU served as the surgical and critical care provider for the polyclinic, and included a fully functional operating theatre complete with a four-bed critical care area. A multi-disciplinary team of surgeons, anesthesiologists, nurses, technologists, and facility support staff provided around-the-clock medical support for the duration of the Olympic and Paralympic Games. After the games concluded, ownership of the MMU was transferred to PHSA.

Today the MMU is an independent program of the PHSA and serves as a provincial resource with five key operational roles:

- Renovation support
- Public health outreach
- Emergency response
- Special event support
- Education

Deployments illustrating the scope of missions undertaken by the MMU are described in the **Table**.

## Equipment and team organization

Equipment for the MMU includes two 16.2-m tractor-trailers, specialized tents and shelters, and a support vehicle (**Figure 1**). One trailer serves

**Table. Sample PHSA MMU deployments, 2011 to 2014.**

Location and date	Mandate
Surrey Memorial Hospital, Surrey, BC 2012	Disaster response for Surrey Memorial Hospital emergency department flooding. Deployed within 24 hours. Notable services provided in the MMU: comprehensive care of CTAS* level 3 to 5 emergency department patients.
East Kootenay Regional Hospital, Cranbrook, BC 2012	Support for intensive care department renovation. Notable services provided in the MMU: comprehensive care of CTAS* level 1 to 5 critical care patients.
Pemberton Health Centre, Pemberton, BC 2013	Support for emergency department renovation. Assisted with continuity of care for local residents. Notable services provided in the MMU: obstetric care, including labor and delivery.
Tsartlip First Nation Health Centre, Brentwood Bay, BC 2013	Primary care, outreach. Experienced greater-than-expected number of patient visits and successful multiagency collaboration. Notable services provided in the MMU: clinics for pediatric asthma and adult general health.
Kitimat General Hospital, Kitimat, BC Nov 2013–Mar 2014	Support for emergency department renovation during a protracted winter deployment. Notable services provided in the MMU: comprehensive care of CTAS* level 1 to 5 emergency department patients.

\*CTAS: Canadian Triage and Acuity Scale



**Figure 1. MMU deployed.**

**The MMU can be an entirely self-sufficient clinical platform with its oxygen concentrator, power generators, and water and waste management systems.**

as the primary patient care area. It is designed for maximum flexibility with its modular expanding bays, and has the capacity to serve as an operating theatre with a four-bed critical care/recovery area, or a ten-bed monitored emergency department, or a

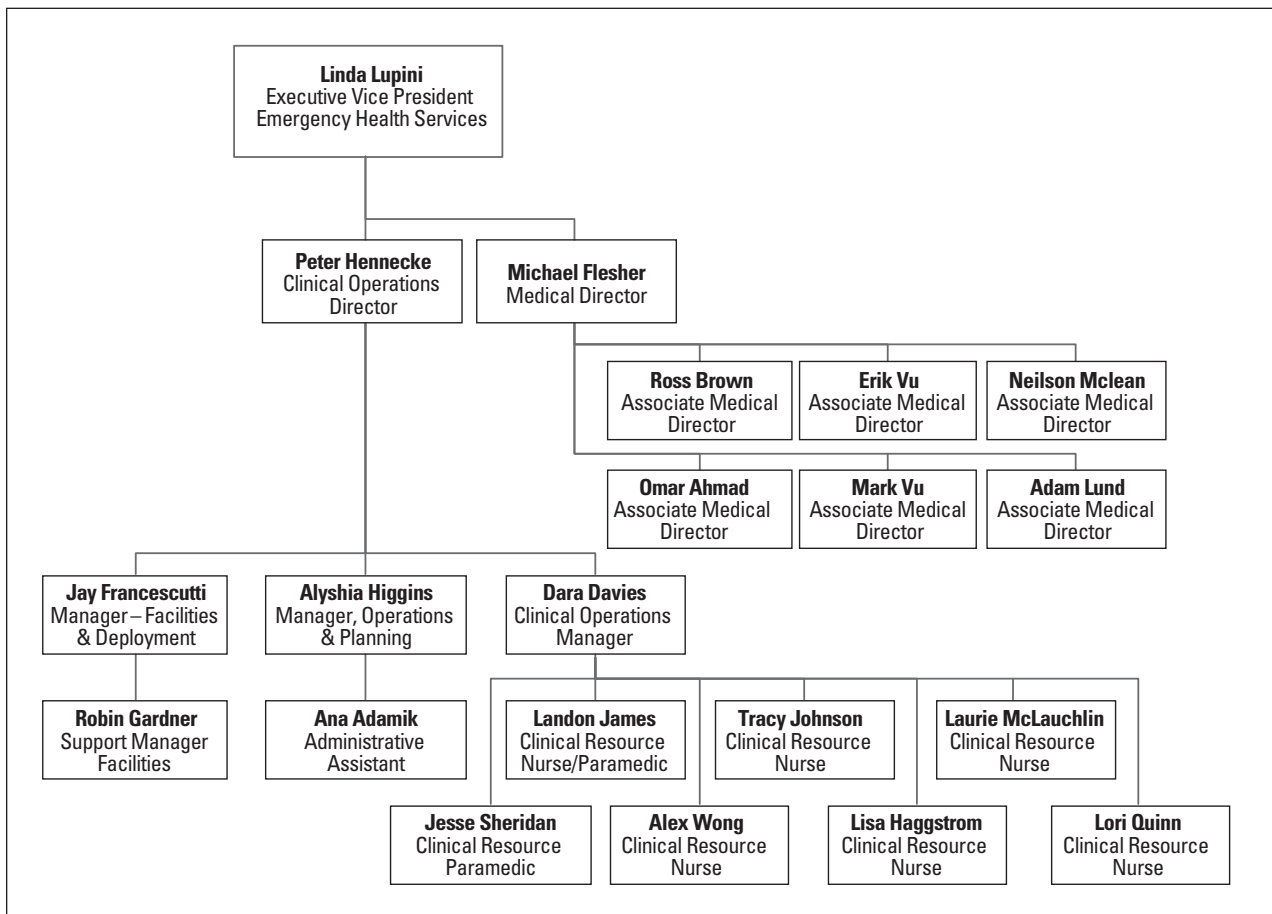
variably configured walk-in clinic (**Figure 2**). The second trailer serves as a support unit and houses a full spectrum of medical and maintenance equipment. The MMU can be an entirely self-sufficient clinical platform with its oxygen concentra-

tor, power generators, and water and waste management systems. X-ray and advanced ultrasonography services, resuscitation equipment, medications, and point-of-care hematological testing are all available. In addition, the MMU clinical footprint can be expanded with specialized tent structures that cover over 550 m<sup>2</sup> if necessary. A complement of full-time, part-time, and casual staff support the day-to-day operations, maintenance, project coordination, clinical education, and medical direction (**Figure 3**).

The administrative office for the MMU program is at PHSA headquarters in Vancouver, and facility storage is in Delta, BC. All requests for MMU



**Figure 2.** Patient care area inside the MMU with three patient simulators shown.



**Figure 3.** MMU program personnel.

deployments are received by the clinical operations director, and reviewed by the MMU team for feasibility and further planning. For emergency disaster response deployments, the MMU can be mobilized in less than 24 hours. The time required to arrive on site and set up is determined by the distance travelled, seasonal conditions, and the complexity of the support services needed.

The MMU team includes operations and maintenance staff with extensive experience in mobile medical facility operations and deployment planning, and health emergency management at regional and provincial levels. The clinical staff includes paramedics, nurses, and physicians with

backgrounds in anesthesiology, emergency medicine, critical care medicine, prehospital care, air medical transport, disaster and tactical medicine, mass gathering medicine, and international emergency medical aid.

To our knowledge, no other health care jurisdiction in Canada has an asset comparable to the PHSA MMU. Other mobile medical services exist in Canada, such as the mobile dental outreach vehicles in Toronto<sup>2</sup> that provide free dental care to underserved populations, and the private industry Iridia Medical Services Mobile Medical Unit that provides mobile primary and emergency medical care to geographically isolated work camps in the north of British Colum-

bia (e-mail communication with Dr Alan Holmes, founder Iridia Medical, 1 April 2014). In the United States, MMU-type systems are operated in a variety of industries. Sports organizations employ MMU-type platforms to bring specialized medical services to the site of major sporting events, and the Department of Homeland Security uses mobile medical units as part of their disaster response planning.

## Deployments

With 3 years of experience serving the province of British Columbia, the PHSA MMU program continues to expand its capacity to meet the ever-increasing requests for deployments. Since becoming a PHSA asset



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in 2010, the MMU has been deployed to 30 sites throughout the province, cared for more than 4159 patients, and hosted over 600 students (e-mail communication with Ms Jesse Veens-tra, project coordinator PHSA MMU, 10 September 2014). It has served as a walk-in clinic, emergency department, intensive care unit, obstetric care unit, classroom with state-of-the-art high-fidelity patient simulators, and disaster response training centre. Surgical capacity in the MMU was established for life- or limb-threatening surgical emergencies during the 2010 Olympic Games, and was activated for the Whistler Crankworx Mountain Bike Festival in 2014 to support the Whistler Health Care Centre. One emergency surgical trauma resuscitation occurred in the MMU during the Olympic games. To date, no elective surgeries have been performed in the MMU. The MMU has cared for critically ill patients during a renovation

support mission to the East Kootenay Regional Hospital in Cranbrook in 2012. One of the most common deployment modes for the MMU is as a mobile emergency department, and in this capacity the unit has supported many sites across the province, including Pemberton, Kitimat, Surrey, Squamish, Whistler, Penticton, and Prince George.

### Funding

The MMU is jointly funded by all six provincial health authorities and planned deployments are distributed proportionately throughout the province. The 2013–2014 operations budget of \$882 000 covered the cost of operating and maintaining the MMU headquarters, paying full-time and part-time staff, and operating three MMU vehicles. This cost did not include payment for personnel providing clinical care in the MMU, as these clinicians are almost always from the

local medical community where the MMU is deployed. Their remuneration is covered by the regional health authorities, MSP, or both.

The MMU team has travelled over 13 000 km since 2011; forged provincial, national, and international partnerships; and worked with public health, private industry, First Nations, and advanced educational institutions. Staff members continue to serve on standby 24 hours a day, 7 days a week, 365 days a year for emergency disaster response to any corner of our province, and, in certain circumstances, for cross-border emergencies as well. The MMU program also continues to collect data on all its missions to optimize efficiency and manage operational costs, and undertakes research on the economic and social benefits of this unique health care service. Inquiries about the PHSA MMU can be forwarded to the clinical operations director, Mr Peter Hennecke, at [peter.hennecke@phsa.ca](mailto:peter.hennecke@phsa.ca).

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### Competing interests

None declared.

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