

Frequently Asked Questions

What do you mean by term 'Motolance'?

Motolance is often used as combination of two terms i.e. Motor Bike and Ambulance. This is referred as all those vehicle(s) which are not 4-wheeler and being used as Ambulance.

Whether Motolance: Patient Transfer System is DRDO technology?

Motolance is generic term for combination of bike and ambulance together in one system. However, this particular Motolance is 'DRDO's Ultraswachh enabled technology'. The primary technologies that get embedded into this Motolance include: (a) Taaran (Safe Passage) Patient Transfer System- Wheel chair model is transferred to (i) Chair-cum-Stretcher type ambulance and; (ii) Stretcher only type ambulance within side car; (b) Anti-microbial coating (compatible with Viscoelastic gel – generic name: Covid Coat+ referred as Sustainable Infection Control; (c) Tapas Aasan (Viscoelastic Gel with CC+): an accessory of Ultra-swachh technology and; (d) Ultraswachh-Ucchvasita Oxygen Concentrator for continuous oxygen support. Even in advance variants, Vayu Swachh technology enabled side car is also included. All these technologies are Ultraswachh series of DRDO launched in October 2020.

How Motolance is different from other ambulances?

Motolance, unlike, 4-wheeler ambulances could be chair-cum-stretcher type with 2-wheeler or Stretcher type with 3-wheeler style models. In comparison, the base motorbike remained same though their category to manage patients is increased. Motolance takes less space on road and higher maneuverability that can allow transfer of patients at faster speed. Motolance can easily be deployed in highly dense areas as it doesn't occupy higher parking space. Motolance is cost effective as compared to their 4-wheeler counterparts. Motolance is 'All Terrain' ambulance which is not feasible in 4-wheeler ambulance. In general, Motolance is a concept to value adds fleet of existing ambulances though it has its own niche & specified functions.

In which areas, Motolance can be used?

Motolances can be used for patient stabilization & transfer at fastest speed from: (a) inaccessible areas owing to narrow lanes & high density of inhabitants; (b) Highways as can be deployed at more extraction points than 4-wheeler ambulance being cost effective; (c) Within small townships/ villages from home to first response clinics; (d) Naxal/ terrorism inflicted zones especially mountain ranges & forests in which either Motor Bikes have more access; (e) Border zones to carry injured soldier for first medical post; (f) Fast extraction from rescue zones due to natural disasters like earthquakes or any man-made disaster with contaminated air (provided necessary protective clothing is available to driver & care taker). In general, it can be used almost all places wherever 4-wheeler ambulance is useful though not present/ deployed.

What is average mileage of Motolance developed on 350CC bike ?

The average mileage of Motolance on 350 CC bike is 25-30 Km / liter which is nearly three times lesser than Advance Life Support and 2.5 times lesser than Basic Life Support 4-wheeler ambulance.

Whether Motolance is more economical than other 4-wheeler ambulance?

Yes, it is definitely economical especially on following aspects: (a) Net cost of Motolance is lesser than their counterpart 4- wheeler ambulance; (b) recurring cost in terms of fuel and maintenance is significantly lesser; (c) easily deployable & transferable to other site is cost effective; (d) can be pooled and useful in International peace keeping missions in no time & at least probable cost. Hence, due to many contributing fronts, the Motolance is an excellent and economical option.

Whether fuel mileage is only criterion that led to evolution of Motolance?

Fuel mileage is one of the criteria for evolution of Motolance, however, more critical one is presence of narrow lanes in urban areas, in accessible remote locations, terrain from hilly, desert, dense forests to coastal regions as well as affordability issues.

How Motolances are evolved and developed? What is its relation with DRDO's Ultraswachh technology?

In 2020, COVID-19 pandemic exhibited a potential of virus (that cannot be seen with naked eye) to disrupt socio-economic and health care structures of society. During that period, Ultraswachh technology is evolved by providing low cost & high quality emergency care devices based on principle of integration of equal or more than two technologies. In this direction, product 'Taaran (safe passage) Patient Transfer System' was evolved. It is wheel chair patient transfer system with ability to prevent any infected air to come into contact with care taker while transferring such patients. In addition it allows safe passage to patient from contaminated environment. This was used in first temporary hospital deployed by DRDO in Delhi to manage Covid-19 victims especially in Triage section and intra-hospital transfer. The successful deployment led to idea of safe transfer of patient from home to hospital. Hence, keeping narrow lanes of high density areas of urbanized set up exhibited a need of transforming wheel chair to chair-cum-stretcher / stretcher only type patient transfer system. The system is evolved and developed as [Motolance: Taaran Patient Transfer System](#). It is an evolved integration model of Ultraswachh technological series.

Why Motolance is still not available since Independence despite significant utilities?

The most attributing reasons for non-availability of Motolances on large scale since Independence include: (1) Non-availability of regulatory codes; (2) Disaster Management Act was enacted in 2005 after which Guidelines for Mass Casualty Event Management that outlines ambulances for emergency use; (3) Evolution of vehicles towards Multi-Terrain Bike that can take load of patients & other devices to transfer from one point to another; (4) Telemedicine and other advancement(s) with satellite connectivity are new additions. All these technological advancement led to generation of an ecosystem that can support development of Motolances.

How Motolance concept is a sustainable solution?

The concept of Motolance is a sustainable solution as whenever manufacturer increases number of medical devices to enhance probability of patient's survival, the base cost of motor bike as well as its recurring cost remained least variable. The same is not feasible with 4-wheeler ambulance as cost of vehicle itself will impact this process. Hence on the question of sustainability, a single 4-wheeler Advance Life Support (ALS) is equivalent to 2-3 Motolances with similar capacity to manage.

Whether Motolance registered in Delhi with All India tax paid is allowed to run on National Highways? If yes, as commercial vehicle fitness is annual feature, how will it be managed?

All the Motolances are registered in Delhi or UP/ site of manufacturing address and then transferred by buyer on his/ her location address and accordingly fitness certificate will be taken by buyer on annual basis.

Motolances are modified bike ambulances, how to get them registered? What about its insurance plan?

All these Motolances are modified patient transfer systems and accordingly get registered commercially in 'customized/ modified' vehicles category in their primary resident state. The annual insurance will be taken covering all aspects will be taken by manufacturer for first year of purchase. Subsequently buyer needs to insure it from next year onwards.

Is Motolance safe?

Yes, Motolance is safe for emergency patient transfer. The term safety is relative, hence we compare 4-wheeler ambulances to Motolance(s), safety of 4-wheeler is always higher. However, if we consider perspective of time to transfer a patient from crowded or in accessible area, the ideal and safe choice is Motolance. Hence their functions are complimentary and safety is considered on priority while developing itself.

What do you mean by 'Multi-Terrain' Motolance? Please explain?

Multi-Terrain Motolance refers to ambulances fitted with Bike such that bike is able to take necessary load and has capacity to be on any type of terrain. Accordingly these Motolances are developed on 350 CC bike (Royal Enfield) which is multi-terrain bike. In ALS or specifically for hilly regions with high elevation, stretcher only motolance can be switched to 650 CC to provide necessary power.

What is guiding principle for deployment of Motolance on National Highways? Is it applicable for State Highways too?

According to Guidelines for Mass Casualty Management- Preparedness- Chapter 4: Capacity Development point number-(xii) "Hospitals on national highway passing through disaster prone areas, will have specialized care facilities. [An ambulance for trauma care supported by trained manpower and equipment will be placed every 50 Km](#) and a trauma care centre at 100 Km under a national highway trauma care project". These are guiding principle for development of Motolance ensuring low cost live saving solution for this challenge. Being guidelines are concurrent in nature, same is applicable to State Highways too.

How Motolances are being maintained? Who does it? What are its challenges?

Motolances are being maintained in three levels: (a) basic maintenance of bike from their OEMs; (b) warranty provision of each third party electronic / mechanical device and its AMC as applicable individually; (c) Load structure (patient convener) is being maintained by manufacturer of Motolance directly. Even all the maintenance aspects mentioned above are coordinated / owned by manufacturer of Motolance(s). Thus, if you are buying from retailer, ask for Manufacturer's details. The challenges of such maintenance contracts are remote locations; inaccessible areas; lack of knowledge and training etc.

Motolances are developed for which 'Ambulance Category: B, C or D'?

Motolance (Stretcher) belongs to overlapping C&D category while Chair type ambulance(s) belong to 'C' type ambulance.

How Chair-cum-Stretcher and Stretcher only type ambulances are different from each other?

Both the ambulances are evolved for different purposed based on feedback of specialists and experts in due course of time. The key features that differentiate Chair-cum-Stretcher and Stretcher only type Ambulances are given below:

Key Feature	Chair-cum-Stretcher Type	Stretcher Type
Purpose	For managing patients with medical emergency	For managing patients with medical & surgical emergency
Patient's position	Aligned on Adjustable Chair while transferring while transformed into stretcher for stabilization or first aid at incident site	Lying on Stretcher
Spinal Injury Patients	Not Advised as they need to be transferred in lying position with complete immobilization	During emergency and non-availability of ALS, it is recommended with variant providing Scoop Stretcher/ Spinal Align Board.
Medical Devices Support Criterion	As per requirement & available space, new devices can be added; however, all device support is in line with Basic-to-Medium Life Support.	Side Car (Patient's Convener System) has sufficient space to accommodate number of medical devices support in line with Medium-to-Advance Life Support.
Multi-Channel Parameter for monitoring Patient's Vitals	5- Channel: SpO ₂ ; Blood Pressure; Pulse; Respiration Rate & ECG.	5- Channel: SpO ₂ ; Blood Pressure; Pulse; Respiration Rate & ECG.
Telemedicine	Available in Moto(CS)-II variant onwards	Available in Moto(S)-II variant onwards
Mobility & Maneuvering	Being less loaded, it has fast mobility and higher maneuvering capacity	Presence of side chair reduces speed and slight impact on maneuvering too
Single Caretaker Management	Transit is plausible but not transfer	Transit and Transfer of Patient both are possible by single care provider as fitted with Auto loader

What are primary functions of 5-channel patient multi-parameter analyzer and is it similar or different to existing smart watches for regular health watch?

3- channel patient multi-parameter analyzer provide real time information about Blood Pressure (BP); pulse oximeter (pulse monitoring), partial oxygen saturation (SpO₂), ECG and Respiration Rate. Smart watch doesn't provide information about oxygen saturation ECG & Respiration Rate. However, smart watches are preventive health care devices while these monitoring devices are emergency alert devices for patients under care.

What is an alternative for oxygen cylinder being empty during transit itself? When will portable oxygen cylinder lasts?

In general basic life support Motolance, there is no alternative support available other than oxygen cylinder, however in Moto(S)-IV variant, 'Ucchvasita' oxygen concentrator is provided. A portable oxygen cylinder (5Kg) lasts nearly 5-6 hours based on continuous or with pulse dose regulator.

Out of Chair-cum-Stretcher and Stretcher only type ambulances, in which type single care provider can manage patient?

Single care provider can manage both transit and transfer of patient in case of stretcher type ambulance as it is being provided with autoloader.

In chair-cum-stretcher type ambulance, chair is transforming into wheel chair, do we need to transfer it to other wheel chair? Is it similar case with respect to stretcher ambulance?

Yes, ideally to make ambulance free, patient should be transferred to another wheel chair, however one can transfer directly to ward bed and then relieve chair accessory of ambulance as it can act as wheel chair too. In case of stretcher, as per standard procedure patient should be transferred to another stretcher (of hospital) and then do the needful.

What type of patients can be transferred in Chair-cum-Stretcher type Motolance?

Medical Emergency Patients can be transferred by Chair-cum-Stretcher Type Motolance however spinal injury or significant traumatic injury requiring 'lying position' in transit cannot be transferred by this type of ambulance.

How patient will be stabilized on Chair-cum-Stretcher type Motolance?

Patient's stabilization protocol and procedures are in accordance with 'Standard Emergency Evacuation Procedures via Ambulances' and it is not specific to Chair or Stretcher type Motolances.

How patient will be stabilized on Stretcher Only Type Motolance?

Patient's stabilization protocol and procedures are in accordance with 'Standard Emergency Evacuation Procedures via Ambulances' and it is not specific to Chair or Stretcher type Motolances.

Out of chair-cum-stretcher and stretcher only type ambulance which is preferable for an expecting mother from remote location?

It is recommended to use stretcher ambulance from transfer of an expecting mother unless emergency with availability of chair-cum-stretcher type ambulance.

What is space area of 'Stretcher based 3-Wheeler Motolance'? Is it similar to standard 4-Wheeler Ambulance or lesser? How functional aspects of Stretcher Motolance are different to justify such space coverage?

Stretcher based Motolance has coverage space area of 5850 sq inch [90" X 65"] which occupy ~1.7 times lesser space than BLS [10368 sq inch- (144" X 72")] while ~3.36 times lesser space

than ALS [19656 sq inch- (216" X 91")]. Further due to 3-wheeler base it require less space to turn or maneuver though it has 350 CC engine, ability to go faster with loaded weight is higher. The optimal usage of available area on bike and attached patient convener unit provides all relevant equipment to stabilize and transfer both medical emergency patient and surgically traumatized patient safely to definitive health care. In light of this information, it is clear that space occupy with additional benefits provided by Motolance makes it fit into requirement of both urban, rural, semi-urban and highways etc.

Is it beneficial to use Stretcher Motolance (SM) as compared to BLS ambulance on 4-Wheeler? Yes it is beneficial to use SM over BLS (4W) based on following attributes: (1) less coverage area of SM in comparison to BLS (4W); (2) Less space required to turn or maneuver; (3) Essential medical devices in addition to portable oxygen is provided with SM; (4) Less fuel consumption thus cost-effective in terms of recurring cost; (5) Increase in number of medical devices/ assistance support system is easy as vehicle remained a constant cost; (6) SM even has rear seat free for patient's care taker; (7) SM's fast mobility from narrow lanes and multi-terrain Bike (350 CC) allows its universal usage and; (8) Less maintenance cost as compared to its counterpart.

Whether the 'patient convener unit' is detachable and can be deployed to any bike or is it restricted to specific model only?

The Motolances are registered and approved as modified vehicle with respect to particular vehicle, its brand and specific vehicle number only. Hence, it is not legally recommendable to detach 'patient convener unit' and attach it to another vehicle, though feasible to do so. It is important to understand centre of gravity and other balancing options are adjusted as per original vehicle only, replacing it with less capacity or different designed bike, is matter of occupational and patient's safety too.

What are specific modifications in Motolance are available to shield driver and patient from climatic impact?

Stretcher Motolance has side car with complete shield to protect patient while PPEs (like Protecton) is provided to patient to protect against rain showers.

Whether a relative can accompany their patient on same Motolance? Which space Is provided for the same?

Only in Stretcher Ambulance, relative of patient can accompany by using rear seat, however, in few variants, this is not plausible

Is there any air conditioning system available in Stretcher Ambulance?

Yes in some advance variants, such system is being provisioned.

Is there any strategy in present day Motolance for neonatal transfer too?

No, not directly, however, if portable Neonatal transfer chamber is available, it can be loaded in Stretcher ambulance.

What are the limitations of Stretcher type Motolance?

The limitations of Stretcher Type Motolance include: (a) Maneuvering is limited as compared to chair type ambulance; (b) training of paramedic on both emergency medical response & driving

skills needed; (c) ALS (4 wheeler) is able to provide even 2-patient transfer too in some cases, the same is not applied here and; (d) fast & economical yet should not be compared to ALS (4 Wheeler) as these are different scales of comparison.

What is Third Eye and whether it is protected by Climate Shield as being operated in open?

Third Eye is a LCD monitor in front of driver fitted into mild steel or equivalent grid preferably with cover and this monitor displays all the vital parameters and other information directly to driver while driving itself.

What are these 'black covered sheets' provided on stretcher or chair, it is being referred as Tapas Aasan? What is Tapas Aasan and what is the significance of such technology?

The black covered gel sheets with 'DRDO' marks are tapas aasan (or referred as Tapasvi Aasan or Seat of Saint). These are elastomeric gel sheets with specialized anti-microbial coating, able to prevent tiring during prolonged seating, anti-vibrational, impact resistant and bed sore prevention technology (even used in OT Positioning Devices), Being anti-vibrational, these technology ensure that patient's transfer is completely smooth and pressure exerted by different terrains should be bare minimum.

Whether Covid Coat+ or Anti-Microbial Coating is same, if yes, is it specific to Covid-19 only or have wide spectra?

Both Covid Coat+ and Anti-Microbial Coating are same. Since it was tested for COVID-19 primarily during Pandemic, it was referred Covid Coat and plus was added due to its ability to get coated on inert elastomeric gel referred as Tapas Aasan. The same is being tested against various WHO priority I nosocomial pathogens too hence, its generic name is 'Anti-Microbial Coat with 90 days sustainability'.

Why Motolance is coated with Anti-Microbial sustainable system as it is generally parked in sunlight only?

The sustenance ability of microbe in different forms and at varied temperature is highly dynamic. The probability of getting infected even after transferring of infected patient needs to be reduced at all levels. One such effort is sustainable anti-microbial coating while another is its sanitization after every shift, both of which lead to development of confidence level and safety of care provider. In case of contaminated patient management, specific kits are available for vehicle or spot decontamination.

What is Ucchvasita and why it is still impending for integration into advance models only?

Ucchvasita is an 'Ultrasonography technology of DRDO' – literally it is an indigenous oxygen concentrator. It requires power support to function efficiently which would ideally be provisioned in advance ambulances.

What is Puncture Resistant Tyre Technology and why it is integrated in Motolance? Is it already being used in any other vehicle(s)?

Puncture Resistant Tyre Technology is evolved from 'Tapas Aasan' sheets. These elastomeric gel with ability to resist pressure upto 1600 psi was poured in its molten state inside the tyre providing coverage to every part. Being closed cell polymer with elasticity of > 500%, it takes shape of internal part of tyres. Once filled with air, the modified tyre was tried with artificial puncturing with long nails. It was observed that nails remained fitted it without any loss of air as well as when removed, internal gel takes over ensuring no leakage of air. No it is novel technology not being used in other vehicles.

What is the utility of GPS Tracking System in Motolance? Is there any other service integrated into GPS Tracking System?

Motolance is a life-saving system require GPS Tracking System so that it can be located especially while transit from inaccessible areas to definitive health care carrying critical patients. Presently Motolance comes with fitted device of GPS tracking as well as annual subscription for track and trace. We are planning to integrate ERP system with complete maintenance alerts etc in future models.

Whether these Motolances will be linked to Satellite(s) for efficient patient transfer system in mass casualty events with large scale destruction?

GPS tracking device are provided with each Motolance however device that can provided two-way communication in remote zones (with no internet availability) via direct satellite linkage is an important feature that is not present in existing Motolances.

What are future plans for Motolance(s)?

The future Motolance(s) will be fully traceable (with satellite connectivity) and provide support in every emergency (whether traumatic or medical emergency); telemedicine compatible; supported with continuous supply of oxygen (by Ucchvasita- an oxygen concentrator); transformable into emergency medical care; mobile diagnostic support; specialized evolution of vehicles to provide sustained energy supply (using solar hi-powered cells); chair-stretcher transformation feasibility; equipped with bio-vest to provide sustained support and other supports.

Why Mobile Diagnostics will be integrated in future Motolance(s)?

Mobile diagnostics is integrated into future Motolance(s) to provide sustainable health care support at remote locations with lease accessibility. These Motolance fleet will be helpful in patient transfer as well as emergency on-site care if provided with diagnostics support.

How Tele-Medicine will be helpful in integrating with Motolance(s)? What might be challenges?

Tele-medicine is a cost effective solution for daily as well as critical care saving transit time of specialist to the site. Motolances being evolved for such On-site care and transit only, telemedicine is an important value addition to the process. The biggest challenge is (a) connectivity in remote locations; (b) trained EMTs/ paramedics to execute as per directions given by specialists; (c) availability of assistive devices/ medicines to do needful; (d) availability of doctors/ specialists at the time of requirement. These challenges are being mitigated by networking approach.

What type of training is requisite for Emergency Medical Technician or Paramedic is required for achieving excellence in operating bike ambulance?

Considering Emergency Medical Technician or Paramedic(s) are trained in management of patients' medical and surgical emergencies, annual refresher course are needed. In addition for excellent operation of Motolance(s): "specialized driving skills" and "single handle emergency operations at remote location with/ without telemedicine support".

Is there any specific requirement/ training requisite for Emergency Medical Technician/ Paramedic for operating Motolance(s)?

Yes, EMT might need to drive vehicle too and should be trained to drive with attached side car. As EMT/ paramedic will be alone while transferring patient hence training to transfer patient single-handedly is required. Trained in provisioning first aid/ emergency care should be extended to include bike ambulance as patient's platform. The last training aspect is (a) behavior; (b) ability to monitor, talk and drive simultaneously and; (c) telemedicine usage while managing critical patients & definitive healthcare unit is at distant location.