CHAR DHAM PILGRIMAGE

Travel Advisory for Pilgrims

Hemwati Nandan Bahuguna
Uttarakhand Medical Education University

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"This handbook is dedicated to all the Patients who keep on teaching us valuable lessons in the subject"

Contributors

Padma Shri (Professor) S.C. Manchanda
(Former Head, Department of Cardiology AIIMS New Delhi)

Professor (Dr) Bhanu Duggal
Vice Chancellor, H.N.B. Uttarakhand Medical Education University, Dehradun

Professor (Dr) Girish Sindhawani
Head, Department of Pulmonary Medicine, AIIMS Rishikesh

Dr Ashutosh Tiwari
Additional Professor, Department of Neurology, AIIMS Gorakhpur

Dr Ashish Uniyal
Registrar H.N.B. Uttarakhand Medical Education University, Dehradun

Dr Vijay Kumar Varada
Senior Resident, Department of Cardiology, AIIMS Rishikesh

Dr Rupendra Nath Saha
Senior Resident, Department of Cardiology, AIIMS Rishikesh

Dr Raghuraj Chawla
Senior Resident, Department of Cardiology, AIIMS Rishikesh

Atul K. Kashyap
PhD Scholar (ICMR - Senior Research Fellow),
Department of Cardiology, AIIMS Rishikesh

Er. Ghanshyam Kumar
Senior Research Fellow (Research Scientist),
Department of Cardiology, AIIMS Rishikesh

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Char Dham at a Glance

Dham	Ht. in metres.	Ht in feet
Kedarnath	3,584	11,759
Badrinath	3,133	10,279
Gangotri	3,140	10,302
Yamunotri	3,293	10,804
Shri Hemkund Sahib	4,572	15,000

Elevation of the Char Dham Sites in Metres and Feet above sea level.

Introduction

Uttarakhand, "Dev Bhoomi," is one of India's most sacred pilgrimage regions. The Chaar Dham Yatra is its biggest spiritual attraction. The four sacred shrines are Yamunotri (3,293 m), Gangotri (3,140 m), Kedarnath (3,584 m), and Badrinath (3,133 m), along with Shri Hemkund Sahib (4,572 m). Official data reveal that a staggering 51.10 lakh pilgrims have visited the pilgrimage sites, with Kedarnath topping the list with 1.20 lakh pilgrims. Managing the large crowds during the yatra requires robust administrative and emergency systems.

Visits to high altitudes, especially by non-professional pilgrims, make them prone to many acute health conditions or decompensation of pre-existing conditions.

Why worry? What happens with an increase in altitude?

High-altitude exposure exposes travellers to cold, low humidity, increased ultraviolet radiation, and decreased air pressure, all of which can cause health problems. The main concern is hypoxia due to decreased partial pressure of oxygen (PO_2). At 10,000 feet (3050 m), the inspired PO_2 is only about 69% of that at sea level. Acute exposure to this reduced PO_2 can lower arterial oxygen saturation to 88–91%.

Diagram of high altitude

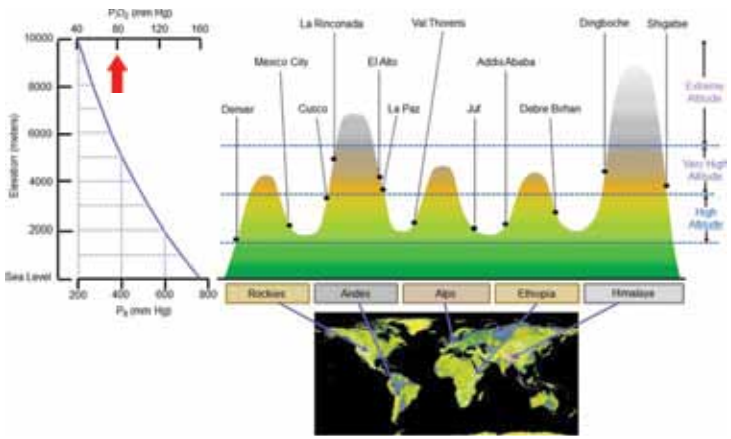


Figure: Global comparison of major mountain ranges and high-altitude cities, illustrating how atmospheric pressure and oxygen partial pressure (PO_2) decrease with increasing elevation across defined altitude zones (high, very high, extreme).

A decrease in PO_2 to 80 mm Hg level would cause the following

1. A decrease in Oxygen levels in the atmosphere will reflect the same in your blood, which will exacerbate cardio-pulmonary symptoms.
2. Combining Hypoxia with environmental stressors like temperature, exercise, dehydration and injury may precipitate angina/ coronary artery disease symptoms.
3. Mountainous locations are remote, with limited access to healthcare.

A decrease in oxygen levels in the air, along with increased oxygen demand due to exertion, challenges the body, which responds by activating various compensatory mechanisms. This may lead to hypoxemia, defined as a reduced oxygen level in the blood. At high altitude, it is important to become acclimatised, and this can be optimised by carefully planning and adjusting travel itineraries.

PREPARING TO TRAVEL

Acclimatisation

GRADUAL ASCENT:

Climbing to a higher altitude slowly gives your body time to adjust to low oxygen levels. It is advisable not to exceed the recommended ascent rate [(984 -1640 ft) (300–500 m)] per day above 2,500 m) and to avoid heavy or unaccustomed exertion during the first 48 hours after ascent. Full acclimatisation to high altitude may take weeks to months. **Acclimatising for at least 2–3 nights at around 8,000–9,000 ft (2,450–2,750 m) before proceeding to higher altitudes is markedly protective against acute mountain sickness (AMS).**

Hypoxemia tends to worsen during SLEEP, so it is advisable to plan an evening DESCENT to a lower altitude whenever possible. Accordingly, the Wilderness Medical Society recommends avoiding ascent to a sleeping elevation of ≥9,000 ft (∽2,750 m) in a single day, limiting ascent to no more than 1,650 ft (∽500 m) per night once above 9,800 ft (∽3,000 m), and allowing an additional night for acclimatisation for every 3,300 ft (∽1,000 m) increase in sleeping elevation.

If you anticipate sleeping above 8,000 feet (2,400 m), particularly if you have a history of altitude illness or other risk factors, you should consult a qualified healthcare professional in advance. During this consultation, discuss your travel itinerary, the availability of medical facilities at your destination, and the potential need for medications to prevent or manage high-altitude illness.

These recommendations may still be excessively fast for some travellers and irritatingly slow for others. Altitude exposure carries very little risk for healthy subjects. Hence, young, healthy travellers without any history of illness may be able to ascend faster. *Nevertheless, it is impossible to predict if you may fall ill while travelling at a high altitude.*

Individuals with diabetes, hypertension, cardiopulmonary disorders, epilepsy, sickle cell disease, or lung conditions such as chronic obstructive pulmonary disease and moderate to severe asthma should seek medical consultation before travel and ascend gradually to allow adaptation to reduced oxygen levels. Additionally, males aged 35 or older and females aged 45 or older are advised to undergo a screening health check-up to detect undiagnosed conditions, such as diabetes, coronary artery disease, or hypertension, before undertaking high-altitude travel. Specific populations/factors increase the risk of developing high altitude illness.

Acclimatisation steps to be followed

- **Avoid getting "too high too fast".**
- Avoid moving from a low height to more than 9,000 ft (2,750 m).
- Avoid exercise during the first 48 hours at elevation.
- Avoid alcohol for the first 48 hours of elevation.
- Regular caffeine users should continue the same.
- If a sudden ascent is unavoidable, you can be prepared with acetazolamide, which can help speed up acclimatisation.
- A high-elevation exposure (> 9,000 feet ~ 2,750 m) for ≥2 nights, within 30 days or as close to, before the trip, helps acclimate your body.
- Plan to stay in the Helipad zone village for a night if planning to ascend by helicopter to the Kedarnath and Badrinath peaks, as the ascent from the nearest Helipad zone (like Sersi village for Kedarnath) is generally more than 1000 metres.

Altitude illness

The acute acclimatisation phase occurs in the first 3-5 days and is particularly critical for travellers. Altitude illness can occur before the completion of the acute acclimatisation phase, but generally not after. It includes acute mountain sickness (AMS), high-altitude cerebral edema (HACE), and high-altitude pulmonary edema (HAPE).

Risk factors for developing high altitude-related illness

- Past history of high-altitude illness
- Over-exertion before adjusting to the altitude change.
- Rapid ascent (within a day) from low level to sleeping heights above 9000 feet (2750 meters).
- Fast ascent (>1,640 to 3,280 feet/day [>500 to 1000 m/day] in sleeping altitude), once over 9,000 feet (2,750 m).
- Physically unfit for exertion
- Have a medical condition that is not controlled/ not evaluated.

Traditional risk factors for heart disease

- Age, Blood pressure, Diabetes, Smoking, Total cholesterol, high LDL cholesterol
- Nearly all heart events occur in individuals with at least one risk factor and presence of even **one risk factor at age 50 years** substantially increases lifetime risk of CAD.

Acute Mountain Sickness (AMS)

Individuals who rapidly ascend to high altitudes (> 6562 ft ~ 2000 m) are at risk of developing acute mountain sickness (AMS), characterised by **headache** as the primary symptom, sometimes accompanied by nausea, loss of appetite, vomiting, sleeplessness, dizziness, and/or exhaustion.

In alpine locations, the prevalence of AMS increased from 7% at 2,200 m to 38% at 3,500 m and 52% while rapidly ascending to 4,559 m.

Symptom onset is usually 2–12 hours after initial arrival at a high elevation or after ascent to a higher elevation, and often during or after the first night. Preverbal children can develop loss of appetite, irritability, and pallor. AMS often resolves within 12–48 hours if travellers do not ascend further and rest at the height.

The illness is usually **self-limiting**, developing and disappearing within 1-3 days. Symptoms that appear 3 days after arriving at high elevation and without additional ascent should not be attributed to AMS. AMS has no distinguishing physical features; Pulse oximetry is typically within the normal range for the elevation or slightly lower.

Treatment

- Travellers with AMS experience rapid improvement with descents of ≥1,000 ft (≈300 m), which can also help diagnose the condition.
- Supplemental oxygen at 1–2 litres per minute will relieve headaches within about 30 minutes and other symptoms over time. A small (5 L) portable oxygen canister may provide partial relief.
- Self-treat with non-opiate analgesics (e.g., ibuprofen 600 mg or acetaminophen 500 mg every 8 hours) and antiemetics (e.g., ondansetron 4 mg orally disintegrating tablets)
- Acetazolamide 125 mg BD can be used as prophylaxis
- Dexamethasone tablets are more effective in rapidly relieving these symptoms.

High Altitude Associated Neurological Complications

Headache, paralysis, seizures, speech abnormalities can be due to stroke, cerebral venous sinus thrombosis, or rarely brain oedema. This similarly can be prevented by taking adequate advice regarding the comorbidities in people with diseases in addition to avoiding excessive exertion in one go and adequate hydration. People having history of thrombosis (anywhere in body) in past are at increased risk of CVST and stroke. In addition to this the risk is further increased if medications like hormones/ contraceptive pills, postpartum phase (before 42 week of delivery), genetic risk/history of hypercoagulable states is there.

So before going to such visits keep in your mind –

1. Get your routine checkups done, specially if family history of disease, having comorbidities (even controlled), elderly
2. Try to make a routine of similar gradually increasing physical exercise preferably one month before the start of visit
3. While on visit take rest at appropriate distances (already everyone will know his/her limits in above preparation phase) and keep yourself well hydrated.

High-Altitude Cerebral Edema (HACE): Patients with a history of traumatic brain injury/ tumours should have a neurological evaluation before travelling to high altitudes.

High-Altitude Pulmonary Edema:

High Altitude Pulmonary Edema (HAPE) is a severe form of Altitude sickness where fluid accumulates in the lungs. It typically occurs at Altitude above 8,000 feet (2,500 meters). It can be life-threatening if not treated promptly.

Prevention

- Gradual Ascent - Ascend slowly to allow your body to acclimate. Spend a few days at intermediate Altitude before moving higher.
- Acclimatisation - Spend one at high Altitude gradually increasing exposure over several days.
- Hydration- Drink plenty of fluids but avoid over hydration.
- Avoid Alcohol and Sedatives - These can depress your breathing and make symptoms worse.
- Medications - Consider medications like acetazolamide or dexamethasone after consulting a healthcare provider.

Treatment

- Supplemental oxygen
- Immediate descent

- **Hyperbaric chambers**

Gamow bag: It is a portable, inflatable pressure chamber used to treat life-threatening altitude illnesses such as high-altitude pulmonary edema (HAPE) and high-altitude cerebral edema (HACE) in remote areas. Functionally, it acts as a portable hyperbaric chamber, providing a critical, temporary, life-saving measure when immediate physical descent or helicopter evacuation is not possible. Using a foot pump to increase

internal air pressure simulates a rapid descent of several thousand feet, thereby improving oxygen availability and allowing the lungs and brain to recover.

- Nifedipine and Sildenafil can be used in field settings

(Dose given in below table to be taken after consulting a doctor)

MEDICATION	INDICATION	ROUTE	DOSE
Acetazolamide	AMS, HACE prevention	PO	125 mg twice a day; 250 mg twice a day Pediatric: 2.5 mg/kg every 12 hours, up to 125 mg
	AMS treatment	PO	x250 mg twice a day1
Dexamethasone	AMS, HACE prevention	PO	2 mg every 6 hours or 4 mg every 12 hours Pediatric: do not use for prophylaxis
	AMS, HACE treatment PO, IV, IM		AMS: 4 mg every 6 hours HACE: 8 mg once, then 4 mg every 6 hours Pediatric: 0.15 mg/kg/dose every 6 hours up to 4 mg
Nifedipine	HAPE Prevention	PO	30 mg SR version every 12 hours or 20 mg SR version every 8 hours
	HAPE Treatment	PO	30 mg SR version every 12 hours or 20 mg SR version every 8 hours
Salmeterol[2]	HAPE Prevention	Inhaled	125 µg twice a day
Sildenafil	HAPE Prevention	PO	50 mg every 8 hours
Tadalafil	HAPE Prevention	PO	10 mg twice a day

Preventing Severe Altitude illness or Death

According to the Health and Disaster Management Department records, approximately 250 pilgrims died in 2024, and approximately 218 pilgrims died in 2025, of which the maximum deaths were due to coronary artery disease during the Yatra, the majority of whom were over the age of 60. Kedarnath remains at the top of this dreadful list, with 110 fatalities in 2024 and 94 fatalities in 2025. Thus, timely management of such a crisis is the need of the hour. The primary goal of educating travellers about altitude illness is to prevent mortality or evacuation rather than to minimise the potential of moderate illness. Because the onset of symptoms and clinical course are sufficiently delayed and predictable, there is no reason for anyone to die from altitude illness unless they are trapped by weather or topography in settings that make descent impossible. Travellers can follow three rules to help prevent death or catastrophic repercussions from altitude sickness:

- Know the early symptoms of altitude illness and be willing to acknowledge when symptoms are present.
- Never ascend to sleep at a higher elevation when experiencing symptoms of altitude illness, no matter how minor the symptoms seem.
- Descend if the symptoms become worse while resting at the same elevation.

PRE-EXISTING CONDITIONS CAUTION REQUIRED

(IN INCREASING RISK)

- Asthma (well-controlled)
- Children and adolescents(specially less than 5 years of age)
- Chronic obstructive pulmonary disease (mild)
- Coronary artery disease (following revascularisation)
- Diabetes mellitus

- Elderly
- Hypertension (controlled)
- Neoplastic diseases
- Obesity (Class 1/Class 2)2
- Obstructive sleep apnea (mild/ moderate)
- Pregnancy (low-risk)
- Psychiatric disorders (stable)
- Sedentary
- Seizure disorder (controlled)
- Angina (stable)
- Arrhythmias (poorly controlled)
- Chronic obstructive pulmonary disease (moderate)
- Cirrhosis
- Coronary artery disease (non revascularized)
- Cystic fibrosis (FEV1 30%–50% predicted)
- Heart failure (compensated)
- Hypertension (poorly controlled)v Infants <6 weeks old
- Obesity (Class 3)3
- Obstructive sleep apnea (severe)
- Pulmonary hypertension (mild)
- Radial keratotomy surgery
- Seizure disorder (poorly controlled)
- Sickle cell trait
- Angina (unstable)
- Asthma (unstable, poorly controlled)
- Cerebral space–occupying lesions
- Cerebral vascular aneurysms or arteriovenous malformations (untreated, high-risk)
- Chronic obstructive pulmonary disease (severe/very severe)
- Cystic fibrosis (FEV1 <30% predicted)
- Heart failure (decompensated)
- Myocardial infarction or stroke (<90 days before ascent)
- Pregnancy (high-risk)
- Pulmonary hypertension (pulmonary artery systolic pressure >60 mm Hg)
- Sickle cell anemia

If you have diabetes and check your blood sugar, be aware that blood glucose meters can produce erroneous results at high elevations. Consult the meter's manufacturer for high-altitude reading recommendations. Always take glucose with you for emergencies.

- Asthma may not worsen at high elevations. However, cold-induced bronchospasm may occur in low-temperature conditions at high altitudes.
- If you utilise oxygen for lung disease, you will require a higher flow rate at higher altitudes. If you don't require oxygen at home for your lung ailment, you may need it at high altitudes. Consult your doctor before you travel. You may want to bring a pulse oximeter to monitor your blood oxygen levels.
- Individuals with sickle cell disease may require oxygen when traveling beyond 7000 feet (2100 meters). If you have sickle cell trait (which some individuals are unaware of), altitude-related issues (for example, spleen injury) can occur even at altitudes lower than 9000 feet (2700 m), however this is uncommon.
- If you have a lung ailment (e.g. COPD, cystic fibrosis, pneumonia, pulmonary hypertension, or sleep apnea), see your doctor before traveling to high altitude.
- Traveling to sleeping altitudes of 8000-9000 feet is safe during pregnancy. If you have any pregnancy issues or are a smoker, see your doctor before going to altitude. pregnant travellers of the dangers of having a pregnancy complication in remote, mountainous terrain.
- At very high elevations, however, some people who have had radial keratotomy procedures might develop acute farsightedness and be unable to care for themselves
- High altitude exposure is shown to have an increased chance of ischemic stroke owing to increased blood viscosity thus, it is advised to undergo a carotid doppler screening before any high altitude exposure to prevent any untoward event

Cardiological Problems in High-Altitude

Patient advisory for high altitude exposure

[A] Hypertension

- Blood pressure to be well controlled for the last 3 months
- Do a 24-hour ambulatory BP monitoring and discuss with your general physician
- Discuss with your physician about changing of drugs if you are planning to ascend over 3400 m
- Avoid any ascent if Blood pressure is more than 180/100 mm Hg till well controlled.

[B] Coronary artery disease

Consult your doctor. Before travelling

- Dehydration should be avoided at all cost
- You should continue pre-existing medications at HA.
- You should undergo stress testing like TMT/ CPET exercise testing to asses functionality before ascent
- All therapy changes, especially dual anti-antiplatelet therapy after drug-eluting stent implantation, must be discussed with a doctor before enactment.
- If you are taking ticagrelor, you might consider changing after discussion with your physician
- Patients should wait at least 6 months after uncomplicated ACS episodes as well as after revascularisation
- Patients should wait at least 6–12 months after coronary stenting before HA exposure.
- Individuals who do not engage in physical exertion at low altitudes should not engage in physical activity at HA.
- May consider taking acetazolamide after consulting

your doctor

- If there is no chest pain on rest or exertion, one can ascend to 4200 m safely and perform light to moderate exercise
- If one has chest pain on mild or moderate exertion, one can ascend to 2500 m safely and can't perform any activities more than light exertion
- If one has chest pain at rest, one should avoid any exposure to height
- If you are diagnosed with an Ejection fraction less than 40% along with your CAD, avoid any ascent till six weeks after diagnosis
- Avoid further ascent and call for immediate help even if you feel the slightest symptom of chest pain, palpitations, diaphoresis
- Asymptomatic or moderately symptomatic stable CAD patients with a negative exercise test at sea level, well-controlled blood pressure, and absence of pulmonary illness can ascend to 3,500 metres with low additional risk.
- In every case, a slow ascent allowing acclimatisation is mandatory.
- Carry a load not more than 30% of one's body weight.

[C] Arrhythmia

- If having a pacemaker in situ, Device interrogations of pacemakers before ascent should be done
- If suffering from PSVT, should be well controlled on medications; no episodes in last three months If suffering from past VT, should have an ICD device in situ (interrogated recently)
- Avoid ascent if untreated/ recent arrhythmia (< 3 months)

[D] Heart failure

- Slow ascent is recommended. It is prudent not to exceed that recommended for healthy travellers (300–500 m/

day when above 2500 m)

- Seasonal vaccinations of Seasonal Influenza, COVID, Typhoidal, pneumococcal vaccine
- Any co-existing conditions like anaemia, obstructive sleep apnoea (frequent snoring), decreased KFT should be adequately assessed
- All drugs should be carefully evaluated and packed in adequate amounts
- Acetazolamide benefits to be asked of your physician
- One who is breathless at heavy exertion may safely reach high altitudes up to 3500 m, and one can do mild physical exertion
- One who is breathless while performing regular household activities may safely reach high altitudes up to 3000 m if needed; not heavier than light physical activity is recommended
- One who is breathless at rest should avoid all height exposure
- Stress testing like CPET/TMT should be considered after discussing with your physician before ascent
- To avoid ascent if there is a history of any hospital admission in the last 3 months for heart failure.

[E] Congenital heart disease

A pediatric cardiologist should be consulted.

- If you suffer from cyanotic heart conditions and right to left shunting, please consult your doctor definitely before any ascent, and try to avoid ascent if possible
- Corrected shunt lesions have almost equal risk as a healthy individual for developing altitude illness; nonetheless, they should have screening echocardiography before travel
- If any corrective surgery is planned in the near future, any high altitude exposure should be avoided at all chances as it may elevate the pulmonary artery pressure and affect the surgery negatively

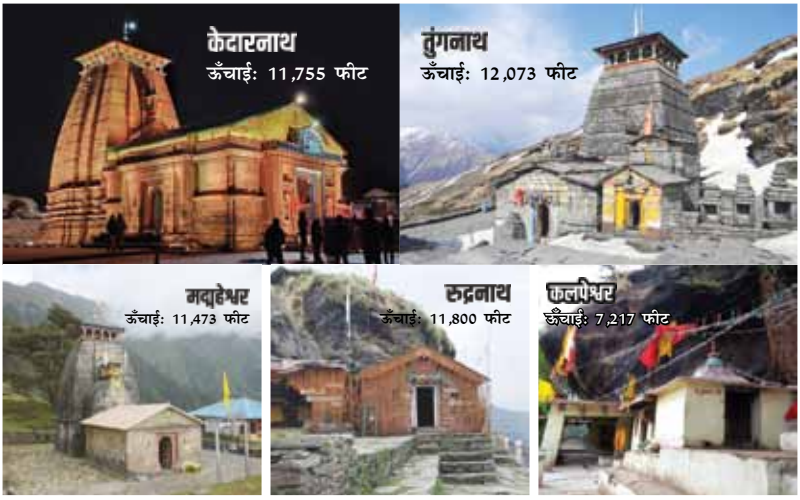
Emergency Preparedness:

1. Closest hospital and emergency evacuation and descent routes to be clearly identified
2. Additional medications including aspirin, clopidogel, atorvastatin, furosemide, acetazolamide, dexamethasone, adrenaline, amiodarone but not limited to should be kept close by
3. Awareness about the symptoms should be properly spread amongst all travellers for quick identification of symptoms
4. Proper communication to the referring team should be maintained

Driver Advisory

- Make sure you are well rested, and your vehicle is in perfect working condition
- Make sure you are trained enough to drive in hilly terrain
- **Do not consume alcohol at least 48 hours before travel**
- Make sure to check spare tyres, insurance, and all necessary legal documents are up to date for your vehicle
- To keep emergency contact numbers in reach of everyone
- Do not use neutral gear when downhill to prevent wearing of brakes
- Do not drive rashly; the road is also as enjoyable as the destination
- Please use Dippers properly to prevent blinding of drivers in the opposite way
- You can carry emergency first aid kit in vehicle
- Do not overload your vehicle more than the recommended limit as per your vehicle capacity

Panch Kedar



Panch Badri

Char Dham Yatra: Do's & Don'ts

Do's

- Ascend gradually
- Acclimatise (gradual adjustment of the body to low oxygen levels) at 8,000–9,000 ft (~2,450–2,750 m) for at least 2–3 nights before ascending further
- Limit activity and take adequate rest during the first 48 hours
- Drink enough water (maintain good hydration)
- If you have any health conditions, get a medical check-up before travel
- Carry prescribed medicines
- Identify the nearest hospital and emergency descent routes
- Recognise early symptoms (headache, nausea, fatigue, dizziness)

Don'ts

- Do not ascend to 9,000 ft or higher in a single day
- Above 9,800 ft (~3,000 m), climb higher during the day if needed, but sleep no more than 1,650 ft (~500 m) higher than where you slept the previous night.
- Do not ignore symptoms of altitude illness
- Avoid alcohol
- Avoid excessive physical exertion before acclimatisation
- Do not travel with serious medical conditions without medical advice

Key Rule

Never ascend with symptoms; descend if symptoms worsen.

“Safe Travel Tips for Char Dham Yatra”

चार धाम यात्रा: ऊँचाई पर सुरक्षित यात्रा के दिशा-निर्देश

High-Altitude Travel Advisory for Char Dham Yatra

ऊपर चढ़ना ASCEND

- **A – Ascend slowly** / धीरे-धीरे चढ़ें
- **S – Sleep low, climb high** / ऊँचाई पर चढ़ें, लेकिन नीचे सोएँ
- **C – Check health before travel** / यात्रा से पहले जाँच
- **E – Exercise moderation (first 48 hrs)** / हल्का व्यायाम
- **N – No alcohol** / शराब न लें
- **D – Drink fluids** / पर्याप्त पानी और तरल पदार्थ पिएँ

लक्षण SIGN

- **S – Sleep problem + headache** / ठीक से नींद न आना+ सिरदर्द
- **I – Irritability / fatigue** / चिड़चिड़ापन
- **G – Giddiness** / चक्कर
- **N – Nausea** / उल्टी जैसा लगना

खतरे के संकेत RED FLAG

- **R – Rest breathlessness** / आराम की अवस्था में भी साँस फूलना
- **E – Extreme weakness** / कमजोरी
- **D – Disorientation** / भ्रम
- **F – Frothy cough** / झागदार खाँसी
- **L – Loss of balance** / संतुलन खोना
- **A – Altered behavior** / व्यवहार बदलाव
- **G – Gasping** / हाँफना

नीचे उतरें DESCEND

- **D – Do not continue climbing** / आगे न बढ़ें
- **E – Evaluate early** / जल्दी जाँच करवाएँ
- **S – Stop immediately** / तुरंत रुकें
- **C – Consider oxygen** / ऑक्सीजन दें
- **E – Emergency if worsening** / हालत बिगड़े तो आपातकाल
- **N – Never ignore** / अनदेखा न करें
- **D – Descend** / नीचे उतरें

जोखिम RISK

- **R – Respiratory disease** / श्वसन रोग
- **I – Illness of Heart (BP / coronary artery disease)** / हृदय रोग
- **S – Sugar (Diabetes)** / मधुमेह
- **K – Known altitude illness** / पहले से ज्ञात ऊँचाई की बीमारी

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CHAR DHAM PILGRIMAGE

Have a happy and safe journey!

HNB Uttarakhand Medical Education University

New Central Hope Town, Bayakhala, Shishambara (Selaqui),
Dehradun Pin 248197 Uttarakhand, India
Phone: 0135-2723321, 2723322, 2528085
Website: www.hnbumu.ac.in | **E-mail:** info.hnbumu@gmail.com

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