S.I.T.E.M.S.H

INTERNATIONAL SOCIETY FOR SKIING TRAUMATOLOGY AND WINTER SPORTS MEDECINE

S.I.T.E.M.S.H

S.I.T.E.M.S.H Congress

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Tehran University of Medical Sciences (TUMS)

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IASEM

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انجمن علمی پزشکی ورزشی ایران

Medical and environmental Organization in Ski Resort

What are the challenges?

Challenges

- ✓ High risk of winter sports injuries (high speeds and risky maneuvers)
- ✓ Problem of extreme conditions and Air travel (High altitude, cold, avalanche, lightning, jet lag)
- ✓ Difficult access to urban clinical settings (Remote areas, Transport problems)
- ✓ Exacerbation of some systemic illnesses

Problem of extreme conditions and Air travel

- High Altitude Illness or HAI (AMS, HAPE, HACE)
- Cold injuries (Hypothermia, Frostbite)
- Lightning
- Avalanche
- Snow immersion
- Jet lag

Environmental causes of death among skiers

- In a study, 274 skier deaths occurred between 1980 and 2001 in Colorado (0.53-1.88 per million skier visits).
- In cross-country skiing, avalanche and hypothermia were reported in 84% and 10% of deaths, respectively. (Xiang & Stallones, 2003)

H.A.I

Cerebral & pulmonary syndromes in unacclimatized persons shortly after ascent to high altitude.

H.A.I Syndromes

- **Acute Mountain Sickness (AMS)**

a public health problem with economic consequences

- **High-altitude Cerebral Edema (HACE)**

- **High-altitude Pulmonary Edema (HAPE)**

HACE & HAPE: uncommon, but potentially fatal

Incidence

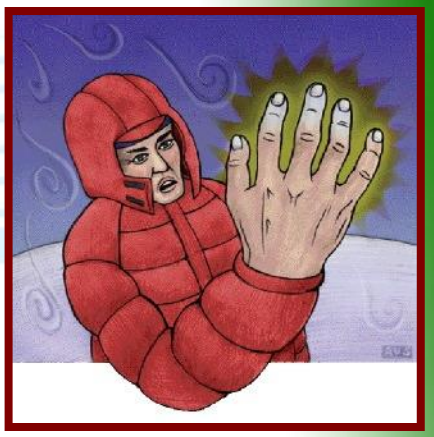
Approximately 20% of tourists to Colorado ski resorts (elevation about 3000 m) will experience AMS.

Approximately 0.01% of tourists to Colorado ski resorts will experience the serious symptoms of HAPE or HACE.

Hypothermia

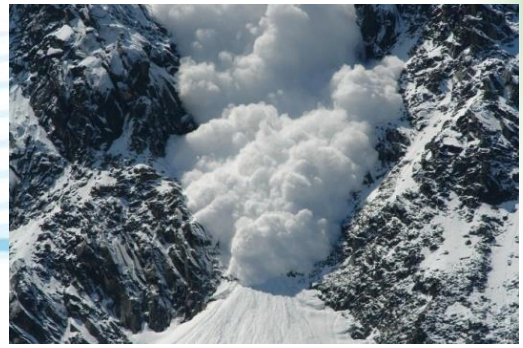
Hypothermia is defined as subnormal body temperature (<35°C). It occurs when the body is unable to preserve a steady core temperature.

Frostbite



- Acute freezing of tissues when exposed to temperatures of below 0°C
- A local anatomic area loses so much heat that ice crystals form in the extracellular spaces
- Most often affects the extremities and exposed areas of the face. Lower extremities, particularly the foot and great toe (57%); hand (46%); exposed areas on the face and ears (17%)
- Frostbite is a disease of morbidity, not mortality.

Avalanche

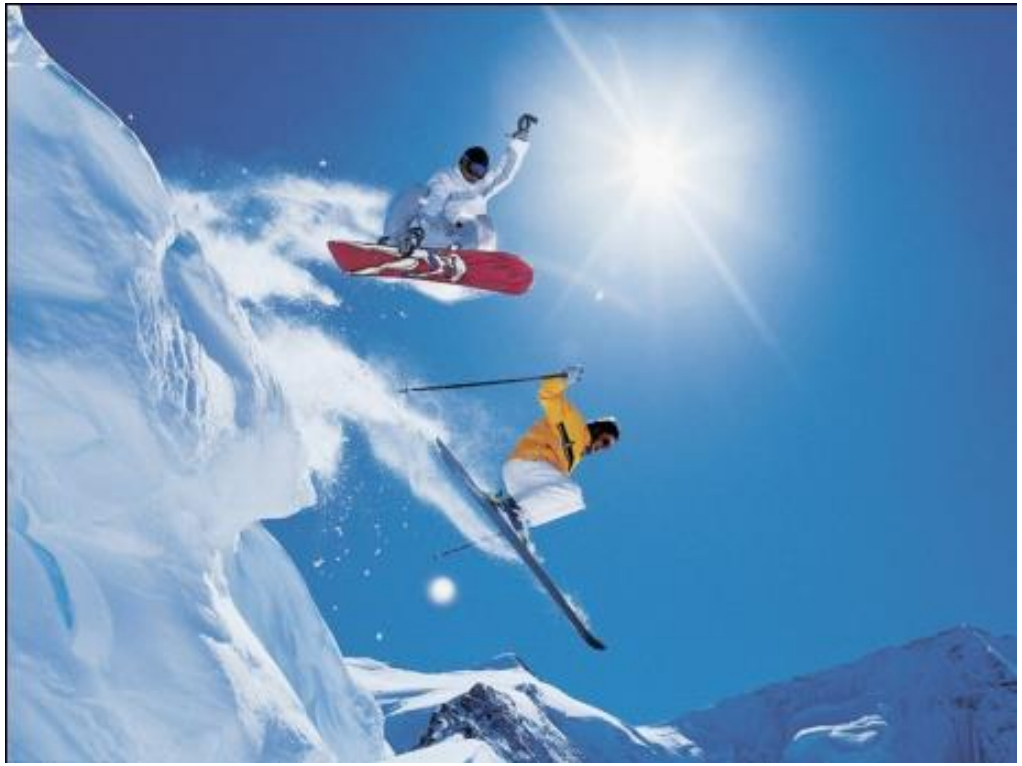


- A medical emergency.
- In all decisions the goal of rapid rescue of the victim(s) must be balanced against the risks to the rescue team.
- Try to bring “docs and dogs” as soon as possible to the site.
- In case of a short burial time a rapid extrication has absolute priority. Critical condition is probably due to acute asphyxia or to mechanical trauma.
- After a complete burial hospitalize for 24 hours for observation.

Avalanche victims

- From 1950 to 2001, 11 skiers were killed within operating ski area boundaries in Canada.
- In all but a case in 1983, accidents occurred in areas that had avalanche hazard or closure postings, or that were marked as non-skiing areas.

Exacerbation of some systemic or local conditions



Respiratory Conditions

- Chronic bronchitis and emphysema (COPD) and other lung conditions with breathlessness at sea level are obviously more severe at altitude.
- Asthma sufferers usually have less trouble at altitude.
- The increased sympathetic drive and adrenal steroid output may also help.
- They should, of course, take a good supply of their usual medication.

Cardiac Conditions

- Patients with symptomatic heart conditions (e.g. unstable angina, heart failure etc.) should not go to high altitude, but patients with systemic hypertension controlled by medication seem not to be at increased risk nor do patients following successful coronary bypass surgery or angioplasty who have good performance at sea level.
- Patients with angina controlled by drugs should certainly consult their cardiologist before considering an altitude trip.
- The question of whether altitude is a risk factor in the etiology of coronary occlusion in previously asymptomatic people, is unknown but the best evidence is that it is not a significant factor.

Blood Disorders

- Patients with anemia will be more short of breath at altitude.
- Patients with bleeding or clotting problems should not go to altitude. Similarly patients on anticoagulation therapy for any reason should probably be advised to choose a holiday where medical help is readily available.
- Patients with sickle cell disease also should not go to altitude. Even with sickle cell trait there is a 20-30% chance that altitudes above 2000 m may trigger a crisis.

Endocrine Disorders

Diabetes mellitus

- Altitude itself probably does not have any effect on diabetes. However the increased exercise is likely to induce hypoglycemia.

Steroid therapy

- Patients who have been on corticosteroid replacement therapy for adrenal failure, should increase their steroids on going to altitude to cover the increased requirement due to the stress of altitude.

Gastro-Intestinal Disorders

- The commonest problems are usually diarrheal disorders and anyone with a chronic preexisting condition (e.g. Crohn's or ulcerative colitis) should probably not plan this sort of holiday.
- Peptic ulcer should be treated before going into the high mountains. Similarly conditions such as hemorrhoids and fissure trivial at sea level can cause real problems in high altitude and need to be dealt with before the trip.

Neurological Conditions

Migraine

- Ascent to altitude may trigger an attack, often a severe one with neurological symptoms.
- It can be difficult to distinguish this from AMS or even HAPE although the headache of AMS is not usually unilateral.

Cerebro-vascular disorders

- Patients with known or suspected cerebro-vascular problems such as TIAs, previous strokes or carotid artery stenosis should probably be advised against altitude travel because of the risk of thrombosis with the high hematocrit.

Neurological Conditions

Epilepsy

- Contrary to what might be expected, there is no evidence that altitude increases the risk of an epileptic seizure, so patients who's epilepsy is well controlled can enjoy holidays at ski resorts, of course with a partner.

Joints and Ligaments

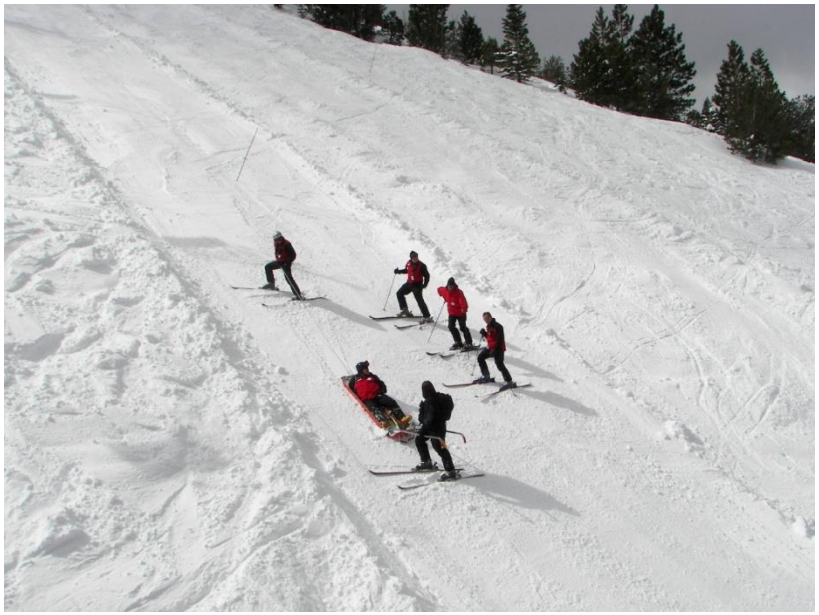
- Skiing may reveal even slight degenerative arthritis in weight bearing joints.

ENT and Dental Problems

- Nasal polyps which interfere with breathing should be dealt with prior to the trip as should any outstanding dental problems. Dental abscesses seem to be very common at altitude, possibly as a reflection of reduced immune function.

Proper medical organization in ski resorts;

A critical need



On- Site Coverage

- Pre-event planning is the most important component.
- Events often are held at remote locations, and local emergency services may be limited.
- The location of local or regional medical facilities and their capabilities should be identified.
- Many events will have a preevent medical meeting where information about protocols and local medical capability will be given.

Roles & Plans

- The role of medical personnel will vary depending on the event circumstances. It is important to know ahead of time who will make decisions about the care of an injured athlete.
- Having an emergency action plan for a skiing event is mandatory. For FIS, a technical director (TD) coordinates the medical coverage. It is important that medical personnel coordinate the plan with the TD.
- Confirmation of the plan always should be done pre-competition as changes may have been made by the competition site.

Positioning of staff

- Ideally, medical personnel will be positioned to see the entire event. This, however, is not always possible, so judgment should be used so that staff members are positioned to allow maximum access to injured athletes.
- Often the finish area is the most practical place to stay, as ski patrol will generally be in charge of removing an athlete from the hill.
- Medical personnel should confirm with ski patrol that there is easy access to spine boards, splinting equipment, and automated external defibrillators, when available.

- Radio communication is commonly used but should be tested ahead of competition as many commonly used radios may be affected by mountainous terrain. Radio and cell phone coverage should be tested before the competition to ensure these modes of communication are feasible.
- It is paramount that medical providers ensure their protection first before attending to an injured athlete. In many events and training, there may be more than one competitor on course.

- Medical personnel should know the protocol for clearing the course or site and always wait until there is a hold on the competition or training before heading out onto the course.
- There have been severe injuries, even death, among athletes and race course workers from collisions because the course worker entered the race course without regard for the “STOPSTART” procedures.

FIS Event Organizer Medical Support System

A. Facilities & Resources

- Appropriate emergency medical services for each official day of training and competition:
- A medically equipped and properly staffed tent or clinic located in close vicinity of the base/finish of event location for initial triage and minor issues.
- Public facility for medical care of spectators.
- Top of course medical care for athlete needs.
- Intermediate medical course stations.
- An Advanced Life Support (ALS) ambulance for transport with a back-up plan if transport is used.
- A fully equipped Advanced Life Support Team and a replacement available with transport at all times during official training or competition.
- A rescue helicopter or medically equivalent evacuation method must be available on a basis consistent with local law. The chosen method of evacuation must be capable of immediate patient off-hill evacuation.

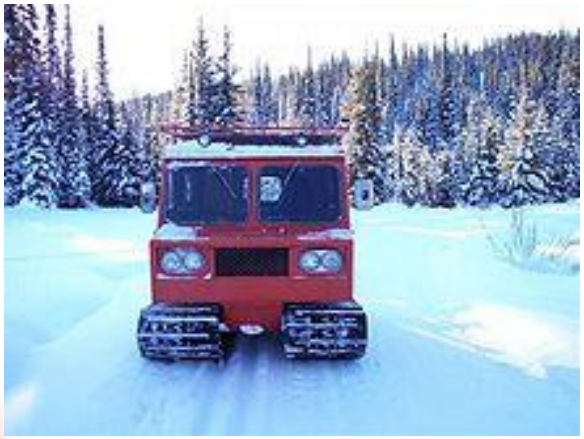
B. Personnel/Staff

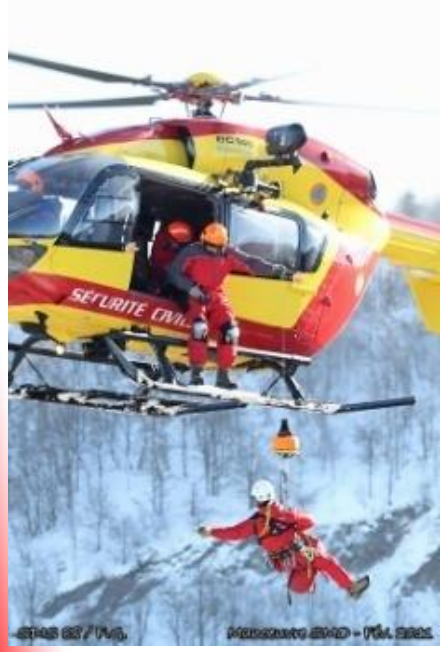
- Event Chief of medical and rescue services (usually a medical doctor, responsible to direct and coordinate all medical services provided at the event.)
- Ski Patrol (first responders to a downed athlete, along the course always have the athlete in view, good skiing skills)
- Trauma Teams (Generally positioned along course where they can reach any critically injured athlete within 4 minutes maximum time limit).
- Team Physicians (may only assist with the field of play athletes care and stabilization under direction of event medical staff.)

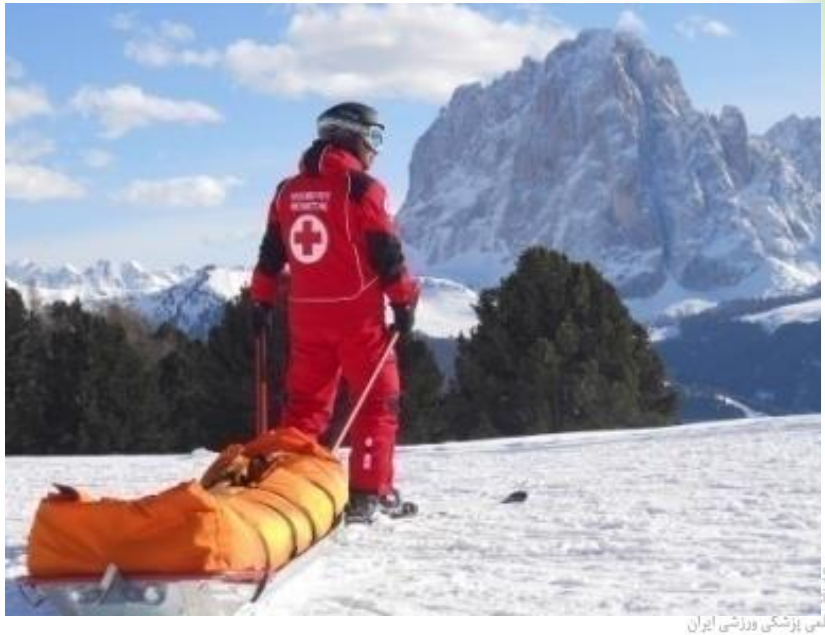
C. Information to the Teams

- On-Course medical support map with details of all stations (staffing/equipment/supplies)
- Evacuation protocols for each level of injury from course with criteria for helicopter transport
- Location/contact phone of Clinic or level I Trauma Centre that athlete would be transported to - depending on Level of Injury.
- Contact for Event Chief of medical and rescue services
- A listing of all local medical services to include the phone contact and address for location.
- A medical meeting for the persons taking care of medical matters in the teams will take place prior to the first official training .

Sample of an event emergency action plan







Event Emergency Medical Services Action Plan

Location: Killington, VT - Bear Mountain Base Event: Freestyle Nationals Date: Mar 21-26, 2006

Prepared Documents for Medical Plan

- Map with Medical Station Locations
- Team Information should include all the information outlined on this plan with a local area map in addition to course specific maps, medical station locations and staffing capabilities.

Local Medical Facilities

- **Medical Clinic**: Killington Medical Clinic(KMC) @ Ramshead/Snowshed-will have van for transportation 10 mins from Bear Mtn Base
- **Contact**: Jim Russell, MD & Matt Gammons, MD Phone: xxx xxx-xxxx
- **Capabilities**: Ortho Clinic with x-ray Hours: 9:30-5pm
- **Pharmacies**-All located in Rutland, VT-25 miles from Even Venue Location

Brooks	CVS	Rutland Pharmacy	Walgreens	Wilcox Pharmacy
7 West St	Rt 7 & 4	Allen St	Rt 7 & 4	252 Stratton Rd
Xxx xxx-xxxx	xxx xxx-xxxx	xxx xxx-xxxx	xxx xxx-xxxx	xxx xxx-xxxx

Event Medical Support Services General Information

- **Medical Meeting Time & Place:** After 1st team captain or in finish area before training.
- **Event Medical Supervisor:** (Ski Patrol Supervisor) Cell: 802 770-8986 Radio #: 8-4/Ch 1
- **Event Ski Patrol Officer**: Radio #: 8-15/Ch 1
- **MD's for Event:** Jim Russell, MD Cell: xxx xxx-xxxx Matt Gammons, MD Cell: xxx xxx-xxxx
- **Nearest Hospital** (Trauma Rating/Nearest Trauma I Hospital)
  Rutland Regional Medical Center (RRMC)-Trauma II-All trauma goes to Rutland, VT 802 775-7111
  Dartmouth-Hitchcock Hospital – Trauma I – anything not handled by Rutland Regional

Event Medical Stations and On-Course Injury/Evacuation Protocol

- **Course Medical Stations (Personnel and Equipment/Capability)**
  - All venues will have 2 ski patrols dedicated for training/competition. In the finish for superpipe and aerials and at the start for Moguls. Patrol will have first aid, c-collar, backboard and O2.
  - Competition- Additional patrol in finish area. AED with MD/Paramedic
  - Ambulance in Parking at Bear base- 100 yds from all finish areas
  - Van for minor injuries- next to ambulance for transport to KMC
- **Injuries**
  - Level I- Minor- Ski Patrol assists if requested. Transport to KMC if needed
  - Level II/III – Moderate- Ski patrol response with MD assist. Stabilize and transport. Stable injuries to KMC. C-spine/Severe Head Injury/ Open Fracture – Ambulance to RRMC
  - Level IV- Severe/Life Threatening. Ski patrol with full assist from MD/Paramedics. Stabilize and transport to RRMC via ambulance. Decision to call helicopter per Paramedics/Event MD and RRMC emergency room on case by case basis.
- **Radio Communication Protocol**
  - Ski Patrol 1st Responder – radio to Patrol/Paramedic at finish and MD
  - Paramedic/MD respond from finish area if necessary
    - Decision for transport/ATLS care
- **Helicopter location(s):**
  - Meet Ambulance at RRMC unless directed otherwise by Paramedic or Event MD

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Jan. 13-15 - Tehran

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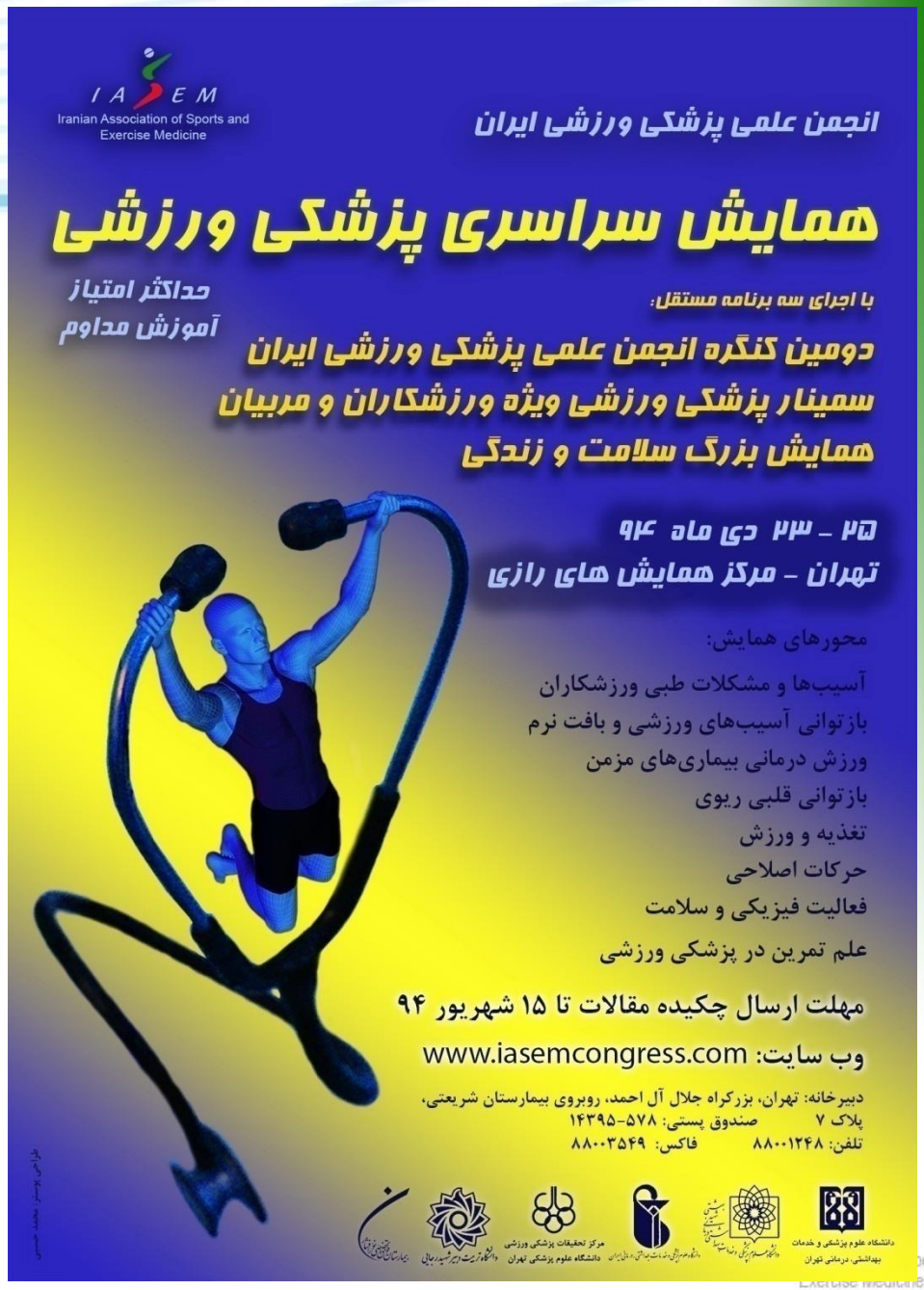

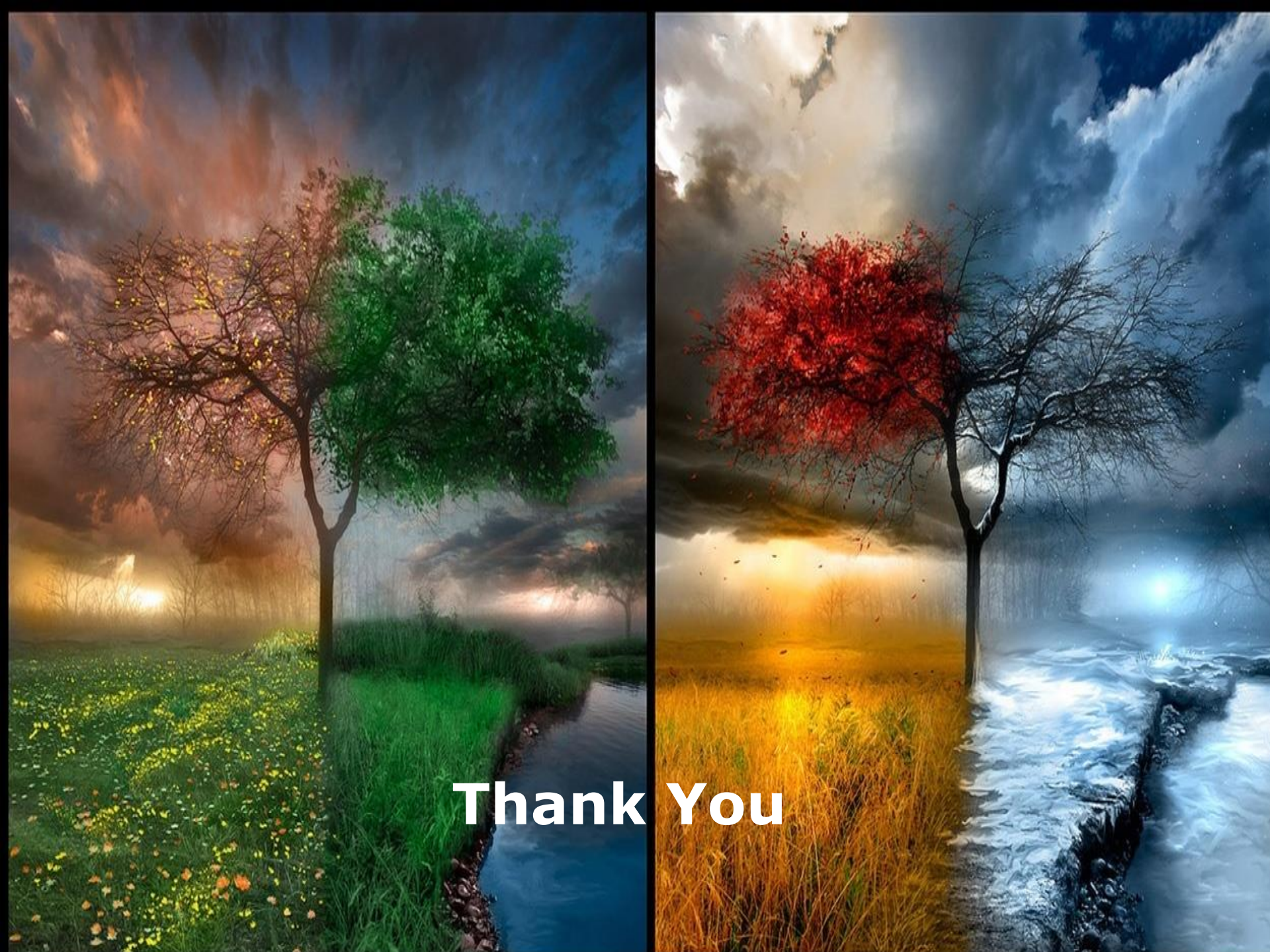
Thank You