

'16

推 薦

医学部医学科小論文 2

注意事項

1. 試験時間は 90 分間です。
2. 試験開始の合図があるまで問題冊子を開いてはいけません。
3. この問題冊子のページ数は 10 ページです。問題冊子、用語集 (3 ページ)、解答用紙 (2 枚) および下書き用紙 (罫線あり 1 枚、罫線なし 1 枚) に落丁、乱丁、印刷不鮮明などがある場合には申し出てください。
4. 答えは指定の解答用紙に記入してください。
 - (1) 文字はわかりやすく、横書きで、はっきりと記入してください。
 - (2) 答案の字数に制限がある場合には、それを守ってください。
 - (3) 訂正、挿入の語句は余白に記入してください。
 - (4) ローマ字、数字を使用するときは、まず目にとられなくてもかまいません。
5. 解答用紙は持ち帰ってはいけません。
6. 問題冊子、用語集および下書き用紙は持ち帰ってください。

次の文章はある書籍からの抜粋である。これを読んで設問 A～G に答えなさい。なお、*のついた単語には用語集があるので必要に応じて参照してよい。

Wilderness* Evacuation*

The mode and urgency of the evacuation should be appropriate for the problem.

Calling for on-site* evacuation (e.g., helicopter) versus evacuating a patient to care by foot or on a litter* is decided upon in view of multiple factors, including:

- Severity of the illness or injury, including the psychological condition of the victim.
- Rescue and medical skills of the rescuers.
- Physical/psychological condition of the rescuers.
- Availability of equipment and/or aid for the rescue.
- Danger/difficulty of extracting the victim(s) by the various means available.
- Cost.

An evacuation deemed* necessarily "urgent" considers the patient's life or significant morbidity* to be at immediate risk. These guidelines indicate "nonurgent" evacuation in cases where the patient requires further evaluation and treatment but is not at immediate risk for significant morbidity or death.

Party leaders must know the capabilities of rescue organizations in the area the group is using and how to contact those organizations. All wilderness leaders must leave trip plans with a responsible person who can act on the group's behalf. If rescue by an outside group (rather than self-rescue by the party) has been determined to be the best course of action, the earlier it is initiated, the better. Waiting may allow deterioration* of the patient and may jeopardize* the entire rescue operation.

When requesting outside assistance, delayed response time, the safety of incoming rescuers, number of personnel* responding, time to assemble, their time commitment*, and the cost of the rescue must be considered. It is important to note that the safety of the rescuers or the group takes precedence* over ideal management of the patient. Optimally, the entire group, including the patient, must make evacuation decisions.

In general, it is appropriate to postpone further travel and/or initiate evacuation from the wilderness for any person who has the following:

■ Sustained or progressive physiological* deterioration, manifested by orthostatic* dizziness*, syncope*, tachycardia*, bradycardia*, dyspnea*, altered mental status, progressive or significant weakness, or intractable* vomiting* and/or diarrhea*; inability to tolerate oral fluids; or the return of loss of consciousness following head injury. In other words, if patients are not improving, they must get out!

- Debilitating* pain.
- Inability to sustain travel at a reasonable pace due to a medical problem.
- Sustained abdominal pain with or without the passage of blood by mouth or rectum* (not from an obviously minor source).
- Signs and symptoms of serious high-altitude* illness.
- Infections that progress for more than twenty-four hours despite the administration of appropriate treatment.
- Chest pain that is not clearly originating from a minor musculoskeletal* injury.
- The development of a psychological status that impairs* the safety of the person or the group.
- Large or serious wounds, or wounds with complications* (e.g., open fracture*, gunshot wounds, deformed fractures, fractures impairing circulation, impaled* objects, suspected spinal* injury, severe burns).

Travel may continue if it is toward definitive care, or when descending in the case of high altitude illness. This is understandably a general list.

<Guidelines for ground evacuation>

If the decision has been made for a member of the party to walk out to obtain definitive* care, the individual must not go alone unless there is no other alternative. Whenever possible, at least two members of the party, who are mentally and physically equipped to do so, must accompany the patient.

If anything more complex than a simple walkout of the patient is required, e.g., a litter carry, an on-site leader must be identified who will assume responsibility for the evacuation. If an outside rescue is to be requested, a decision must be made on the most efficacious* method of requesting this help. A request for help is often exercised via electronic communication, e.g., a cell phone, but in all cases the request should be written first to ascertain inclusion of all the relevant information. The written request should include an assessment* of the patient, of the

situation (to include equipment, personnel, food, water), and a detailed location (map preferred) of the patient. The note should also include potential hazards to rescuers, limitations for vehicles*, etc. Experience has shown that taking the time to write out a detailed note actually decreases total evacuation time. In assessing the anticipated* length of evacuation time, the note must include the expertise* and rescue experience of the persons in the field with the victim. In many countries a method of payment must be indicated before a rescue will be made. Without electronic communication, a written request for assistance will be hand-carried out by one member, but preferably two or three members, of the party.

During a litter evacuation, at least four (preferably six) bearers must handle the litter at all times, except when physically impossible, such as carries over a narrow bridge. Additional personnel must be available to relieve those handling the litter.

The number of litter carriers will ideally be eight persons per 100 meters of travel over rough terrain* and six persons per 100 meters over reasonably smooth trail. A total of eighteen litter carriers are required for the safest management of the litter over an extended distance. It is very demanding to carry a loaded litter for more than fifteen to twenty minutes without rotating porters or a significant break. Litter carries, especially over rugged* terrain, can be agonizingly* slow. One bearer (a) will be in charge of the litter, directing lifting and moving, directing the passing of the litter over obstacles, and assuming responsibility for continuously monitoring and reassuring the patient. Many teams standardize the position at the left front of the litter as the litter "driver's" position. It is best to support a litter skeletally* by utilizing straps, webbing*, or pack frames rather than depending on hand grips.

The patient must be carefully "packaged" in the litter for maximum safety and comfort. Protect the patient's head and eyes. Pad stress points (e.g., where the straps press against the body) and the voids* (e.g., in the small of the back and behind the knees). Protect from wind, cold, and precipitation*. To prevent decubitus* ulcers*, have the patient move occasionally or alter the patient's position at least every two hours if he or she is unconscious. Expect to handle urine* and fecal* elimination* by allowing the functional patient to leave the stretcher* with assistance (if serious spine injuries can be cleared), or provide appropriate tilting and/or cleansing* toweling to catch excrement*. To prevent deep vein thrombosis* it is necessary to allow leg movement or to move or massage legs hourly, as long as this does not increase the severity of the original injury. If the litter is improvised*, test the system and padding first on an uninjured person.

<Guidelines for helicopter evacuation>

Helicopters can significantly reduce the time to definitive care when used for emergency transportation of the sick or injured. The decision to use a helicopter for an evacuation must take into account clinical, logistical*, and environmental factors.

Using a helicopter always adds an element of risk both to rescuers and victim, and a note requesting an air evacuation should include all known specific hazards relative to the rescue. This risk must be balanced against the risk to the patient, other members of the party, or the rescue team if the patient is evacuated by ground. Evacuate by helicopter only if:

- A victim's life will be saved.
- The victim has a significantly better chance for full recovery via a helicopter evacuation.
- The pilot believes that conditions are safe enough to do the evacuation.
- A ground evacuation may be unusually dangerous to the ground crew.
- Ground evacuation would be excessively prolonged.
- There are not enough rescuers available for a ground evacuation.

Four important points must be kept in mind:

- It may be faster to evacuate a patient by ground rather than wait for a helicopter (especially in high-risk flight conditions).
- The patient will need to be evacuated by ground if the helicopter is not able to respond, or if removal from the accident site would benefit the patient (e.g., descent for altitude sickness).
- The patient may need to be moved to an appropriate landing site.
- Do not use a helicopter to recover a corpse under emergency conditions.

Helicopters have various configuration*, with different capabilities and different crew skill levels. All helicopters are adversely affected by increased altitude, high environmental temperature, high wind, and heavy payload*. The aircraft pilot makes the ultimate decisions concerning flight operations. A helicopter must not fly into known icing conditions or into even moderate storm conditions. Winds more than 45 mph*, night flights into mountains, and landing in high winds are extremely hazardous. Not all helicopters or pilots are capable of flying by instruments into cloudy or foggy conditions. Moreover, instrument flight rules (IFR) are generally used only for airport-to-airport transport, not in flights to wilderness destinations, and most EMS* helicopters are not equipped for IFR. Party leaders must be familiar with

ground-to-air signals, and if radio communication is available, the ground crew must keep the helicopter crew updated on weather and other related conditions at the scene.

Landing and taking off are the two most dangerous activities for both the air and ground crews. As altitude increases, the ability to make vertical hovers* and land in small areas is greatly reduced. The optimal* landing zone (LZ) is large, well marked, and relatively flat with a slope dropping slightly away from the LZ, and it has no tall objects on the perimeter* and no loose debris* that could be thrown up by the rapidly spinning blades. Marking at an LZ is best done with green reflective material and second best with red. The LZ may have to be prepared by the on-site personnel. It must be far enough from the patient so any maneuvering* by the helicopter does not put the patient at risk. If there is no suitable landing zone, helicopters equipped for short haul* or winch* operations may be used.

The on-site personnel handling the patient must have some familiarity with helicopter operations. Helicopter landing zones are dangerous places. It is imperative* to keep all nonessential personnel away from the area. If possible, assign personnel to keep a safe perimeter around the landing zone and to prevent people from approaching the craft. Wind generated by the helicopter is tremendous, and all ground personnel must protect themselves when the aircraft lands and takes off. In winter the wind chill from the rotor* blades can cause rapid frostbite* to areas of exposed skin. Never approach a helicopter until a signal has been given by one of the aircraft personnel. Never approach a helicopter from the rear, where the spinning tail rotor is invisible and therefore dangerous, unless it is a rear-entry aircraft and the safe-approach signal has been clearly understood. Once the helicopter is on the ground, all directions from the aircraft crew must be followed explicitly*.

The mechanics and physiology of flight must be understood if it is to be safely used for patient transport. Noise and vibration levels are high, and it may be difficult to monitor or even communicate with the patient in flight without special equipment. Helicopter cabins are not pressurized*. Atmospheric and oxygen pressure go down as the aircraft goes up. Supplemental oxygen must be available for all patients. Medical devices with air bladders*—e.g., MAST (military anti-shock trousers), air splints*, and endotracheal* tubes—must be monitored for overinflation*. Ground transport may be a safer alternative for patients with a suspected pneumothorax*, decompression* sickness, or air embolism*.

Do wilderness travelers have a "right" to be rescued?

In the United States, it is often assumed that a cry for help will bring an immediate response, free of charge. There is, however, no guarantee that a rescue will be initiated, free or

otherwise, despite the concerns of family and friends, the pressure of the media, and the availability of eager and willing rescuers. Evacuations from the wilderness create risk for the rescuers—who must walk in or fly in—and are typically very expensive. Search and rescue managers have to make tough decisions based on numerous factors, and the condition of the patient is only one of these factors. It is improper, therefore, to ask for help out of convenience when a group could carry out a self-rescue. Request assistance as a last resort, when life or limb is threatened, or when the group is unable to carry out their own rescue.

(出典 : Wilderness Medical Society; Practice guidelines for wilderness emergency care, 5th edition. edited by William W. Forgey. The Globe Pequot Press, Guilford, 2006.)

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【用語集】

- agonizingly : 耐えきれないほどの
- altitude : 標高
- anticipated : 予測される
- assessment : 評価
- bladder : ふくろ、気体の入った袋
- bradycardia : 徐脈（脈が遅く打つこと、またその状態）
- cleansing : きれいにすること
- commitment : 従事、参加
- complications : 合併症、複雑な状態
- configuration : 形状
- debilitating : 衰弱させる程の
- debris : 堆積物
- decompression : 減圧症（気圧が低いことによっておきる病気）
- decubitus : 褥瘡^{じょくそう}、とこずれ（皮膚などが局所的圧迫により血行障害をおこしてただれること）
- deemed : 考えられる
- definitive : 信頼のおける、確実な
- definitive : 最終的な
- deterioration : 悪化
- diarrhea : 下痢
- dizziness : めまい
- dyspnea : 呼吸困難
- efficacious : 有効な
- elimination : 排泄
- embolism : 塞栓症（血管内で生じた血の固まり、または外来異物等が血管の細かい部位に流れて行って詰まる病気、状態）
- EMS : emergency medical services 救急医療サービス
- endotracheal : 気管内
- evacuation : 避難
- excrement : 排泄物
- expertise : 専門的技術

explicitly : 明確に、はっきりと
fecal : 便
fracture : 骨折
frostbite : 凍傷
haul : たぐり紐
hover : 空中停止
impairs : 損なう
impaled : 貫通した、突き刺された
imperative : 必須の
improvised : 簡易の、にわか作りの
intractable : 難治性の
jeopardize : 危うくする
litter : 担架
logistical : 物流の
maneuver : 操作する、移動する、巧みな飛行をする
morbidity : 不健全、病的状態
mph : miles per hour
musculoskeletal : 筋骨格系の
on-site : 現場からの
optimal : 最適の
orthostatic : 起立時の
overinflation : 過膨張
payload : 有効荷重 (飛行機等の搭乗者、積載物の総重量)
perimeter : 周囲
personnel : 隊員
physiological : 生理学的な
pneumothorax : 気胸 (肺の周囲の腔所に空気が入り込み、肺が小さくしぼんで
しまう状態、病気)
precedence : 優先
precipitation : 降雨
pressurized : 加圧された
rectum : 直腸 (大腸の末端部で、肛門の手前の部分)
rotor : 回転翼
rugged : 荒れた、起伏の多い

skeletally : 骨格的に、構造的に
spinal : 脊椎の
splint : 副え木、当て木
stretcher : 担架
syncope : 失神
tachycardia : 頻脈 (脈が早く打つこと、またその状態)
terrain : 地形
thrombosis : 血栓症 (血管内で血が固まる状態、病気)
ulcer : 潰瘍 (皮膚や粘膜におきたただれのため、深部まで損傷した状態)
urine : 尿
vehicle : 乗り物
void : 空隙
vomiting : 嘔吐
webbing : 帯ひも
wilderness : 荒野、大自然の残された地域
winch : 巻き上げ機

設問

- A. 本文の記述によると、厳しい屋外環境での退避・救助活動において“urgent”と“nonurgent”はどのように区別されるか。解答用紙 $\boxed{2-1}$ のA欄に日本語40字以内（句読点を含めて）で説明しなさい。
- B. 本文の記載に基づき、外部に救助を要請する場合に伝達すべき事項を日本語で6項目あげ、解答用紙 $\boxed{2-1}$ のB欄に日本語で記入しなさい。
- C. 本文の記述によると下線部aの“one bearer”は通常どの位置に配置され、どんな役割を担うか。解答用紙 $\boxed{2-1}$ のC欄に日本語60字以内（句読点を含めて）で説明しなさい。
- D. 本文の記載に基づき、傷病者を安全・快適に担架で搬送するために配慮すべき事項を6項目あげ、解答用紙 $\boxed{2-1}$ のD欄に日本語で記入しなさい。
- E. 本文の記載に基づき、ヘリコプター搬送に不利な条件を4つ、ヘリコプターを出動させるべきでない危険な状況を3つあげ、解答用紙 $\boxed{2-2}$ のE欄に日本語で記入しなさい。
- F. 図1のように、2人の救助者A、Bが障害物を超えながら、救助ロープを肩にかけて傷病者を搬送している。傷病者にかかる重力が重心に集中しているとし、救助ロープの質量は無視できる程小さく、空気抵抗も無視できるとして、以下の問いに答えなさい。
- 但し、救助者Aの肩と傷病者の高さの差を h [m]、救助者Bの肩と傷病者の高さの差を H [m]、救助者Aの引くロープと鉛直方向のなす角度を α 、救助者Bの引くロープと鉛直方向のなす角度を β とする。
- 1) α が 60° 、 β が 30° 、傷病者にかかる重力が W [N]の時、救助者A、Bの肩にかかるそれぞれの力 F_A 、 F_B の大きさを計算し、計算式および F_A 、 F_B を解答用紙 $\boxed{2-2}$ のF-1)欄に記入しなさい。
 - 2) 1)の条件下で搬送中、救助者Aの肩からロープが外れ、傷病者が救助者Bの真下に向かって振り子運動を始めた。傷病者が地面の水平部にぶつかることなく、救助者Bの直下の垂壁に激突した場合、激突直前の傷病者の速度を計算し、解答用紙 $\boxed{2-2}$ のF-2)欄に計算式および速度を記入しなさい。但し、重力加速度を 9.8 m/s^2 、 H

を 3.0 m 、 $\sqrt{3}=1.7$ とし、答えは小数第 1 位までの数値で記しなさい。

- G. 救助のためにヘリコプターが飛来したが、平坦な場所がないため着地できず、地上 19.6 m の高さを毎秒 10 m で水平に直進しながら救助物資を投下した (図 2)。投下した救助物資はヘリコプターの物資投下地点の真下から何 m 前方に着地するか計算し、解答用紙 2-2 の G 欄に計算式および着地点の位置を記入しなさい。但し、重力加速度は 9.8 m/s^2 とし、投下物資に対する空気抵抗は無視できるものとする。また、解答は小数第 1 位を四捨五入した整数で記しなさい。

図1

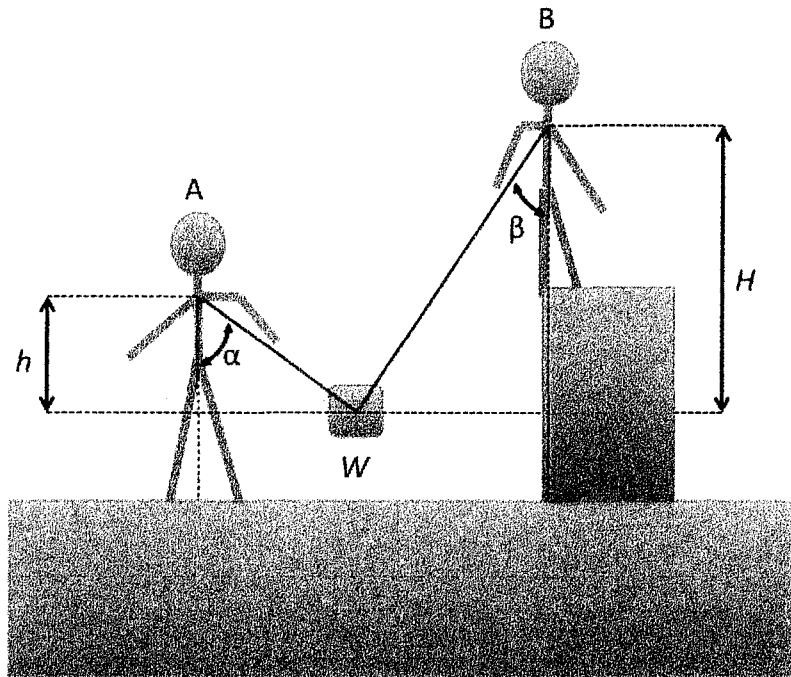


図2

