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ABSTRACT

Culled from the answers of physical education teachers and coaches, this booklet attempts to indicate the scope of health problems and suggests some directions which the solutions may take. It is divided into three parts. Part 1, Health and Safety in Activity Programs, answers questions on first aid, excused absences, and desirability of competition for girls, and contact lenses in physical education classes. Part 2, Nutrition and Stimulants, discusses diet, water and exercise, smoking, and pep pills, while Part 3 is on infections and disease. A selected bibliography is provided. (JA)

answers to health questions in physical education

JOINT COMMITTEE ON HEALTH PROBLEMS IN EDUCATION
OF THE NATIONAL EDUCATION ASSOCIATION AND THE
AMERICAN MEDICAL ASSOCIATION

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Preface

The Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association was established in 1911. Since 1939 the committee has consisted of ten members, five from each of the participating organizations, holding annual meetings alternately at the NEA Center in Washington, D.C., and AMA headquarters in Chicago, Illinois.

The Joint Committee has concerned itself with varied aspects of the total school health program. Among the topics discussed in 1969-70, for example, were (a) sex education in schools, (b) defenses against health quackery, (c) aids to teachers facing special-interest groups, (d) student dissent, and (e) health education in community colleges.

One area of attention over the years has been the relationship between health and physical activity in the schools. Some 20 years ago, the committee recognized the importance of providing sound information in answer to the many health questions raised by physical education teachers. A booklet was published to make these facts available and it was enthusiastically welcomed by teachers. In 1958 the publication was revised and reissued, adding new questions and supplementing answers with up-to-date facts and new medical knowledge.

Here now in 1970 is the third edition, prepared by the Joint Committee. It covers the basic problems that face the physical educator in his everyday responsibilities. The answers incorporate the latest results of research findings. The committee anticipates that this new edition will continue to perform a vital service for the physical education teacher and help him better carry out his responsibilities to the young people under his instruction.

The committee here acknowledges and commends the work of all those committee members and consultants who worked on the two earlier versions of this publication. The persons involved in preparation of the present edition are listed on the following two pages.

Special thanks go to Robert Kaplan, for his contribution as editor.

Appreciation is expressed to the American Association for Health, Physical Education, and Recreation for the final editing and publishing of the pamphlet.

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Contents

Introduction

Teachers of physical education are confronted daily with health problems. Questions arise not only from contact with students in the classroom, gymnasium, and athletic field, but also from the official relationship of these teachers to the administration of the school and to its patrons. The physical education teacher is often asked to participate in the school health program in some capacity or other. Parents sometimes seek the advice of the physical educator regarding the growth and development of their children. The physical education teacher is expected to be informed on the problems of athletic training and conditioning.

The physical education teacher is sometimes unable to give accurate answers to health questions asked of him, because his preparation has not included the specialized areas of the health and medical sciences. Diagnosis and treatment of injury or disease, of course, are not the responsibility of the physical educator and attempting to practice these is both educationally unsound and illegal.

Every school needs a plan which will use the knowledge and talent of the physical education teacher in safe and constructive ways, a plan which will make it possible for the physical education teacher to utilize medical, public health, and school health personnel for consultation.

Such a plan and program are essential in any modern school, regardless of size. There are problems involving the health of students with respect to disease and accident prevention, emergency care, environmental sanitation, nutrition, and other matters, which require a working program with written policies and agreed-to practices ready to govern the situations as they arise. The policies and practices should reflect the best of educational, medical, and parental judgment, and the program should have the support of the local medical society and local health department.

Once policy has been established, it becomes the obligation of all concerned to conduct their part in full acknowledgement of it. With such an established school health program, the physical education teacher and the athletic coach have a group of associates from whom solutions to common health problems can ordinarily be drawn.

This publication was prepared to indicate the scope of health problems in physical education and to suggest some of the directions which the solutions may take. Many physical education teachers and coaches were asked to submit typical questions and problems which they encounter. Possible solutions to them have been composed by several specialists in medicine, health education, and physical education. The solutions given are based upon research, or when such is not available, upon expert opinion; or the solutions reflect the best practice as recommended and accepted by competent leaders in the various fields.

Teachers using this material are cautioned not to assume that the "last word" has been written. New facts are being discovered about

health every day. Space limitations and the complexity of some of the questions make it necessary to sacrifice full discussion to brevity in some instances. Selected additional readings have been suggested at the end of the questions.

This publication should be thought of as a "guide" for helping all individuals who assume responsibility for the physical education and athletic activities in the school to meet better some of the perplexing health problems with which they are confronted. It also may serve as a discussion guide for the pre-service and in-service preparation of teachers of physical education as they assume their share of responsibility for the health of school children.

part 1 Health and Safety in Activity Programs

Desirable practices for healthful and safe conduct of physical education and athletic activities for men and women are proposed by physical education and medical groups. The questions and answers here reiterate and reinforce some of their recommendations. Many of the questions and their answers are related. For more complete information, the reader should see all associated items. Among the more common questions asked by physical education teachers and coaches relating health to the conduct of the program are the following:

1. What are the most important health precautions to be observed in activity programs related to health examinations, interschool competition, and length of the playing season?

All students should be given a *medical examination* at least once every four years.[1] For students in physical education and athletics it is strongly recommended that they have a recheck and review by a physician once a year unless otherwise indicated. For both educational and medical reasons, it is recommended that whenever possible, the family physician administer the examination. The information from such examinations is basic to the classification of students for activities.

Specifically concerning the purposes of medical evaluation for athletic participation (which would apply to girls and women too) is the following from the AMA Committee on Medical Aspects of Sports:

- Determine the health status of candidates prior to exposure to participation and competition.
- Provide appropriate medical advice to promote optimum health and fitness.
- Arrange for further evaluation and prompt treatment of remediable conditions.
- Counsel the atypical candidate as to the sports or modification of sports which for him would provide suitable activity.
- Restrict from participation those whose physical limitations present undue risk.

The health examination of athletes can be administered in a number of ways. In some places, athletes are examined by their family physician on an individual basis. Where a school or team physician is available, he sometimes does the examining. In other communities, the local medical society or health department has established an accepted procedure. Nonetheless, these basic considerations are common to any arrangement:

- In fairness to the aspiring candidate, health examinations should be scheduled far enough before the beginning of practice or conditioning program to allow — if indicated — appropriate consultation, diagnosis, and treatment. They require ample space in a quiet room with reasonable privacy and with no demands for undue haste.
- The evaluation should extend from the sport in question to all sports normally available to the youth in that community. Not all sports are of the "collision" or even body contact variety. Approval for selected

athletics may be possible even when there are conditions obviously disqualifying for sports of rigorous nature. One annual health examination would then suffice except when the candidate 1) has experienced a significant injury or illness since the last evaluation, or 2) the candidate has been encouraged after successful surgery and/or therapy to seek re-evaluation.

- The physician should be cautioned to avoid giving any guarantee that it will be safe for the candidate to participate. In addition, he should not undertake medical treatment without the parent's prior consent, expressed or implied, except for first aid or emergency care which is reasonably necessary to save life or limb. Beyond these considerations, if the physician conforms to the standards of good medical practice in his community, there is no reason why medical supervision of an athletic team risks legal liability any more than in any other area of medical practice.[2]

There are a number of conditions which would disqualify the student athlete from certain activities. Some of the conditions which may make it necessary to bar a youth from sports are absent organs, acute infection, bleeding tendencies, convulsive disorders, diabetes, emphysema and asthma, enlarged liver, enlarged spleen, and heart disease.[3]

Competition should take place only between teams of comparable ability, age, size, weight, and maturity. Competition between unevenly equated teams merely as a preseason "tune-up" or for money-making purposes cannot be justified.

It is strongly urged that no competition, either intramural or interscholastic, under game conditions be permitted until the athletes included have appropriately trained in the fundamentals of the sport and have become properly conditioned.

The length of playing season is governed by league or association rules, and should not be exceeded. High school athletic associations, with the advice of the National Federation of State High School Athletic Associations, establish the permissible length of playing seasons for their member schools. Standards frequently tend to err on the long side, and shorter seasons would usually be more favorable to the student-athlete.

[1] Joint Committee on Health Problems in Education of the NEA-AMA, *Suggested School Health Policies*, fourth edition, Chicago: American Medical Association, 1966, p. 15.

[2] Committee on Medical Aspects of Sports, American Medical Association, *A Guide for Medical Evaluation of Candidates for School Sports*, Chicago: American Medical Association, 1965, p. 1. (The reader may also be interested in the section on "Disqualifying Conditions for Sports Participation," pp. 4-5.)

[3] Hein, Fred V., "Why Some Boys Should Stay Off The Team," *Today's Health* 45:72, August 1967.

2. Should excuses from physical education activity classes from private physicians be honored? How can the problem of abusing excuses best be handled?

Excuses for students written by physicians not only *should be* honored, but for the welfare of the student and because of the possibility of legal liability, the physical education teacher *must honor* such excuses. However, the teacher, principal, or school medical adviser should always feel free to contact the personal or family physician and discuss the excuse in the best interest of the student.

> Waiving a student's privilege of participation in physical education is a serious decision for a physician, one that can profoundly influence the student's physical growth and emotional development. . . . Excuses from physical education which deprive a young person of desirable developmental experiences in this area should not be granted unless there is a clear and overriding health reason wherein the student cannot participate except in a prescribed program of restricted activity. Currently, there is general agreement among both physicians and educators that when *good* programs exist, "blanket" or overall excuses from physical education are unnecessary.
>
> A *good* physical education program offers opportunity for the student to participate in a wide variety of activities with differing degrees of intensity. This enables the physician to guide a student with a health handicap into a program of physical education adapted to his individual needs.
>
> The practice of classifying students . . . has become increasingly common. . . . The specific objectives of classification are: (1) To safeguard the health of the participants, (2) To group pupils for effective learning, (3) To equalize competitive conditions, and (4) To facilitate progress and achievement. Essential to proper classification is knowledge of program content by the physician.[1]

In addition to communication between the physician and the educator, emphasis is placed on the need for a varied program of physical education for boys and girls, including an adapted physical education program.[2]

How the problem can best be handled is summarized by the Committee on Exercise and Physical Fitness of the American Medical Association in its report on "Classification of Students for Physical Education."

- There is a great need for better communication among all interested parties. Physicians need to be fully informed about all aspects of the local physical education program.
- It is important that the physician provide all pertinent information on why an excuse has been issued. This can be done without divulging privileged information by providing an interpretation of the condition rather than medical findings.
- Inadequate physical education programs must be strengthened, since pupil resistance to physical education often stems from lack of proper equipment, facilities, and teaching personnel.
- There is need in many locations to widen the physical education offerings by increasing the variety of available activities, so that

more young people will be able to experience satisfying physical recreation which contributes to their well-being.

- Every pupil should have the kind of exposure to physical education which promotes understanding of the significance of physical activity in maintaining health and in motivating the individual to regular lifelong physical activity.
- Modification of a youth's physical education program in terms of his special needs should be substituted for blanket excuses.

Finally, there should be a school policy which has the support of the local medical society governing temporary excuses from physical education for health reasons. The teacher of physical education, through appropriate administrative channels, should initiate discussions with the school medical adviser and school administrator regarding the establishment of such policies where they do not exist.[3]

[1] Committee on Exercise and Physical Fitness, American Medical Association, "Classification of Students for Physical Education," *Journal of the American Medical Association* 199:265-67, January 23, 1967.
[2] Committee on Exercise and Physical Fitness, AMA, "The Need for Varied Activities in Physical Education Programs," *Journal of Health, Physical Education, Recreation* 36:6, June 1965.
[3] For additional discussion on this subject, see American Academy of Pediatrics, *Report of the Committee on School Health*, Evanston, Illinois: The Academy, 1966, pp. 69-71.

3. What precautions should the physical educator take in the absence of medical examinations of students?

Conditions can develop between examinations or even shortly after an examination, that warrant modification of physical activity. Also, some insidious conditions may escape detection in the most careful examination.[1]

The use of one of a number of tests to check physiologic response to exercise, to aid in classifying students for activity or referral, and to check individual progress in the development of physical fitness is recommended.

The Recovery Index is particularly convenient. It requires only a step-up bench and a timer and can be administered in a short time. For the convenience of students of both sexes, the height of the bench can be adjusted to the following scale:[2]

Student's Height	*Bench Height*
Under 5 ft.	12 in.
5 ft. to 5 ft. 3 in.	14 in.
5 ft. 3 in. to 5 ft. 9 in.	16 in.
5 ft. 9 in. to 6 ft.	18 in.
Over 6 ft.	20 in.

The student steps up and down on the bench 30 times a minute for four minutes. After this, he or she sits quietly for a minute and then a series of three pulse rates are taken. The total pulse count is applied

to a scale to determine the Recovery Index — the individual's response to moderately strenuous exercise.

By observation and screening, physical educators can be alert to *unusual* reactions to exercise. Signs of distress which would require referral for medical opinion are: excessive breathlessness, bluing of the lips, pale or clammy skin, unusual fatigue, persistent shakiness, and muscle twitching.

Symptoms which may be observed or reported to the physical educator and, if they recur or persist, may require referral to the physician are: headache, dizziness, fainting, broken night's sleep, digestive upset, pain not associated with injury, undue pounding or uneven heartbeat, and disorientation or personality changes.

Not to be ignored is the health history available on student health records which should include previous examinations, nurses and teachers screening and observation reports, and concerns expressed by parents and the students themselves.

[1] Committee on Exercise and Physical Fitness, AHA, "Health Problems Revealed During Physical Activity," *Journal of Health, Physical Education, Recreation* 36:6, September 1965.
[2] The Recovery Index Test and its administration are described in detail in the reference in footnote number one. Because the Bench Height Scale was not included in the above reference, it is given in our answer. See also: Committee on Exercise and Physical Fitness, "Is Your Patient Fit?" *Journal of the American Medical Association* 201:117-18, July 10, 1967.

4. Are there special health and safety precautions that should be taken or emphasized in the conduct of particular activities, e.g., track, swimming, basketball, football, and field hockey?

Many of the precautions teachers and coaches are concerned with are discussed on these pages. Some particular measures that may be emphasized are suggested by the nature of the activity. Authoritative texts on the administration of athletics present in some detail necessary health and safety precautions. A national conference produced a report on this topic.[1] Policies for administration and supervision, teaching techniques, facilities and equipment, first aid and emergency procedures, and accident investigation and reporting are enumerated.

A specific precaution made mandatory by the National Federation of High School Athletic Associations is the use of face guards and mouth guards to protect the teeth of football players. A Joint Committee on Mouth Protectors of the AAHPER and the American Dental Association presented comprehensive information on this subject, leading to establishment of the regulation.[2]

Studies on football headgear and face guards offer appropriate precautionary measures in regard to safety and visibility.[3] Face masks for ice hockey goalies and helmets for all players are recommended.

Where appropriate, the use of unbreakable eyeglasses, eyeglass guards, or contact lenses prescribed by an ophthalmologist should be used.

Precautions in swimming are well known. The expansion of all aquatic activities in recent years requires additional expert teaching, professional vigilance, and a knowledge of first aid procedures.[4]

National conferences are conducted which propose health and safety policies for girls and women's sports.[5] These reinforce the need for sports activities for females and for sound administrative policies to support safe participation.

In some sports, the rules are explicit in regard to safe equipment. Fencing, for example, has a remarkable safety record in spite of the vigorous use of steel "weapons." Concern for safety is inherent in the rules of all sports and the rules should be strictly enforced.

[1] Second National Conference on Accident Prevention in Physical Education, Athletics, and Recreation, *Suggested School Safety Policies*, revised edition, Washington, D.C: American Association for Health, Physical Education, and Recreation, 1968.
[2] See also: French, Charles A., "What You Should Know About Mouth Protectors," *Journal of Health, Physical Education, Recreation* 33:22, May-June 1962.
[3] Schneider, Richard C., M.D. and Antine, Bartley E., M.D., "Visual-Field Impairment Related to Football Headgear and Face Guards," *Journal of the American Medical Association* 192:616-18, May 17, 1965.
[4] Struhl, Theodore R., M.D. "Medical Supervision of an Aquatic Program," *Proceedings of the Sixth National Conference on the Medical Aspects of Sports*, Chicago: American Medical Association, 1964, pp. 49-53.
[5] For example, the series of National Institutes on Girls Sports conducted by AAHPER's Division for Girls and Womens Sports.

5. To what extent may teachers of physical education, coaches, and trainers administer first aid to injured pupils?

Physical education teachers, coaches, and trainers should be qualified to administer and should administer ONLY FIRST AID: *the immediate care of injury or illness until medical care can be obtained.* Standards for first aid are those commonly prescribed by the American Red Cross, Civil Defense, state departments of health, the AMA, and other scientific authorities.

> Recommended first steps for first aid to students or athletes are:
> STOP play immediately at first indication of possible injury or illness.
> LOOK for obvious deformity or other deviation from the athlete's normal structure or motion.
> LISTEN to the athlete's description of his complaint and how the injury occurred.
> ACT, but move the athlete *only* after serious injury is ruled out.[1]

What *not to do* is as important as knowing what needs to be done. A student who is unable to move his head or extremities *should be moved only* with medical supervision. This is a sign of possible neck or spinal injury and further damage may result which can lead to permanent injury or even death.

Teachers and other nonmedical personnel should necessarily avoid the tendency to diagnose conditions. This is the responsibility of the physician.

A physician should be in attendance at all events where there is risk of serious injury. Or, arrangements to obtain a doctor quickly, if

needed, should be carefully planned. Care beyond first aid can only be administered under the immediate supervision of a physician.

In all schools written policies for emergency situations, known to all personnel, approved by the board of education and medical society, should be followed.[2] Local boards of health may be helpful. Approval and agreement on such matters will frequently prevent dangerous practices on the part of unqualified personnel. Serious misunderstandings and perhaps litigations between parties can be avoided. More importantly, the health of the student can be more readily protected, maintained, and perhaps improved.

[1] See also: Committee on Medical Aspects of Sports, "First Aid Chart for Athletic Injuries," *Tips on Athletic Training IX*, Chicago: American Medical Association, 1967, pp. 22-23. Also available in poster size chart from Department of Health Education, American Medical Association.

[2] For details and suggestions, see Chapter 11 of *School Health Services*, revised edition, by the Joint Committee on Health Problems in Education of the AMA and NEA, Washington: D.C.: NEA, 1964, pp. 221-45.

6. Is it all right for individuals who have been injured to continue play after first aid is given?

After any period of unconsciousness or possible injury to the head, neck, or spine, it is advisable to take the player out of the game. Only after examination and approval by a physician should the player be allowed to return. At all interscholastic contests and practice sessions where the injury hazard is great, a physician should be present to determine appropriate care for injuries and to decide concerning continuing play.

The insistence of some coaches that a player continue to play after he has been injured or that a pain-killing drug be administered so that a player may continue is dangerous and inexcusable. Additional and more permanent damage to the player may result. The decision to return an injured player to the game is a medical decision to be made by the appropriately qualified physician, not the coach.

7. What responsibility regarding injuries does the physical educator or coach have beyond first aid?

There are several responsibilities. The physical educator and coach are responsible for the prevention of injuries through proper training and conditioning of participants and for ensuring that equipment, apparatus, and protective clothing of good quality are available. Protective equipment is useful only when it is of good quality, properly fitted, and worn by players. Adult leadership is also responsible for making certain that playing fields and surfaces are safe and appropriate for the activity. They must enforce the use of clean uniforms, clean and safe shower facilities, and common hygienic practices.

They must employ sound judgment in matching contestants by size, weight, age, and maturity. They must insist on appropriate

periodic medical examinations at least once every four years for all students and once prior to the annual practice season for athletes. Except in unusual circumstances, a medical examination for athletes is necessary only once a year. Handicapped students and students returning to activity after illness or injury should be assigned to adapted physical education activities with the advice of their physicians.

After an injury occurs and first aid has been given, the physical educator or coach should encourage young people to obtain prompt medical care when it is needed. He may call the matter to the attention of their parents or refer the injured participants to their family physicians, school nurse, or school medical adviser.[1]

In addition to professional and moral responsibilities in the education and care of the student athlete, physical educators and coaches must recognize the possibility of legal liability. They should be familiar with such concepts as "negligence," "the reasonably prudent person," "foreseeable hazards," and "professional standards."[2]

[1] See also: Safeguarding the Health of the Athlete" in *Tips on Athletic Training VIII*, American Medical Association, 1966, p. 23.
[2] See also: *Who Is Liable For Pupil Injuries?* Washington, D.C.: National Education Association, 1963.

8. Who should assume the responsibility for permitting a student to return to regular physical education classes or to athletic competition after absence due to injury or illness?

The medical adviser to the school, or the family physician, or the team physician, depending upon established local and school policy, should assume this responsibility. The physical education teacher and the coach should not attempt to judge when a student has recovered from an injury or severe illness. In such instances, to permit return to strenuous activity involves medical diagnosis.

Appropriate policies and procedures which may include the services of the school nurse can facilitate the return of students to activity and school work.

9. Is interschool competition desirable for girls?

Yes. If exercise and sports programs are good for boys, then they are also good for girls.

> The health benefits of wholesome exercise are now well substantiated, and are just as pertinent to the female as the male. The woman who maintains a high level of health and fitness can meet family or career responsibilities more effectively, and can pursue avocational interests more enjoyably. Also, and not unimportant, participation in healthful physical recreation is now accepted, rightfully, as contributing to the feminine image instead of detracting from it. . . . Participation in soundly administered sports programs can contribute significantly to an increasing health consciousness and a better directed desire for a dynamic womanhood.[1]

As with programs for boys, providing wholesome activity for *all* girls is of prime importance. Interschool competition for girls, also known as extramural competition, should be designed to complement and supplement intramural and instructional programs. Extramural competition includes:

1. Sport days — school or sport group participates as a unit.
2. Telegraphic meets — results are compared by wire or mail.
3. Invitational events — symposiums, games, or matches, for which a school or sport group invites one or more teams to participate.
4. Interscholastic, intercollegiate, or interagency programs — groups which are trained and coached play a series of scheduled games and/or tournaments with teams from other schools, cities, or organizations.

Of course, all activity programs — particularly interscholastic competitions — must adhere to sound practices. The Committee on Medical Aspects of Sports reiterates for girls: "Periodic evaluation of five major factors — proper conditioning, careful coaching, good officiating, right equipment and facilities, and adequate medical care — are basic to the administration of healthful and safe sports programs."

The following standards have been recommended by the AAHPER Division for Girls and Women's Sports:[2]

1. The medical status for the player is ascertained by a physician and the health of the players is carefully supervised.
2. Activities for girls and women are planned to meet their needs, not for the personal glorification of coaches and/or sponsoring organizations.
3. The salary, retention, and promotion of an instructor are not dependent upon the outcome of the games.
4. Qualified women teach, coach, and officiate wherever and whenever possible, and in all cases the professional background and experience of the leader meet established standards.
5. Rules approved by DGWS are used.
6. Schedules do not exceed the ability and endurance relative to the maturity and physiological conditioning of the participants. Standards for specific sports are defined by DGWS and appear in sports guides published by the American Association for Health, Physical Education, and Recreation, 1201 Sixteenth Street, N.W., Washington, D.C. 20036.
7. Sports activities for girls and women are scheduled independently from boys and men's sports. Exceptions will occur when the activities and/or time and facilities are appropriate for both.
8. Girls and women may participate in appropriate corecreational activities or teams. Girls and women may not participate as members of boys and men's teams.
9. The program, including health insurance for players, is financed by budgeted school or organization funds rather than entirely by admission charges.
10. Provision is made by the school or organization for safe transpor-

tation by bonded carriers, with chaperones who are responsible for the sponsoring group.

[1] Committee on Medical Aspects of Sports, American Medical Association, "Sports Opportunities for Girls and Women," *Journal of Health, Physical Education, Recreation* 35:46, November-December 1964. See also: "Athletics for Girls," *Tips on Athletic Training VII*, American Medical Association, 1965, pp. 3-4.

[2] Division for Girls and Women's Sports, *Statement of Policies For Competition in Girls and Women's Sports*, Washington, D.C.: American Association for Health, Physical Education, and Recreation, 1964. See also: *DGWS Guidelines for Interscholastic Athletic Programs for High School Girls*, AAHPER, 1965, and *Philosophy and Standards for Girls and Women's Sports*, revised edition, AAHPER, 1970.

10. What is the basis for deciding whether an activity is too strenuous for girls?

Assuming that we are dealing with normal, healthy girls as established by medical examination, the criteria which provide a basis for determining whether an activity is too strenuous for boys are the same for girls. Fatigue, not exhaustion, is a guide for judging how much activity can be tolerated at any one time. Inability to sleep or to sleep soundly may be an indication that activity has been too strenuous. Muscle soreness is normal during the initial periods of exercise. If it persists in a regularly scheduled program it may be an indication that activities are too strenuous.

During their menstrual periods, many girls experience no particular difficulties during even the most vigorous activity. For others, indications that exercise is too strenuous may be more apparent during menstruation. Fatigue, excessive flow, and general discomfort are good guides for determining how much to curtail the extent and severity of activity.

Moderate exercise often helps to provide relief for some girls who experience a feeling of sluggishness and heaviness in the early stages of the period.

More important to the physical educator and coach is the recognition of symptoms which may indicate a cardiovascular or pulmonary problem. For such cases even moderate activity may be too strenuous. This problem is discussed in more detail in question number three. Other aspects of this question are discussed in items 11 to 14.

11. Does strenuous activity have an adverse effect on the menstrual cycle or on the reproductive organs?

The few studies that have been reported to date indicate the likelihood of no change in menstrual patterns in female athletes. A few female athletes observed favorable changes and a few unfavorable changes (which also might occur in a non-athletic group).[1] Also, there is no evidence that strenuous sports participation by girls will adversely affect subsequent child bearing as women. In fact,

among women who did not engage in physical activity and sports since childhood, inactivity is associated with chronic severe low backache following pregnancy.[2]

In one recent report it was observed that exercise (synchronized swimming) has no adverse effect on the menstruation of high school girls. The girls who exercised consistently had less discomfort during menstruation than less active girls.[3]

Of course, if girls suffer discomfort during menstruation (the condition known as dysmenhorrea) a medical evaluation is necessary before exercise can be recommended.

[1] Erdelyi, Gyula J., M.D., "Women in Athetics," *Proceedings of the Second National Conference on the Medical Aspects of Sports.* Chicago: AMA 1960, p. 59. See also, Higdon, Hal, and Higdon Rose, "What Sports for Girls?" *Today's Health* 45:21-23, 74-76, October 1967.

[2] Gendel, Evalyn S., M.D., "Women and Medical Aspects of Sports," *Journal of School Health* 37:427-31, November 1967; and "Physicians, Females, Physical Exertion, and Sports," *Fourth National Institute on Girls Sports Proceedings*, Washington, D.C.: AAHPER, 1968, pp. 9-12.

[3] Anderson, Theresa W., "Swimming and Exercise During Menstruation" *Journal of Health, Physical Education, Recreation* 36:66-68, October 1965.

12. Can girls go swimming during menstruation?

Yes. It is apparent that girls *do* go swimming while menstruating. They engage in strenuous competitions — swimming meets including high diving and synchronized swimming during the menstrual cycle. There is no evidence of any harm occurring as a result of swimming during menstruation.

While the average for initiation of menstruation is thirteen years, many girls reach menarche at nine and ten years of age.

Physical educators and coaches should recognize the need to discuss menstruation and menstrual protection devices with young female students.[1]

The selection of sanitary napkins or tampons should be made on the basis of personal preferences after consultation with one's family physician. In view of more recent scientific evidence, personal choices in the matter should be encouraged.

[1] Thomas, Clayton, M.D., "The Influence of Menstrual Protection Devices on Vaginal Physiology," *Journal of the American College Health Association* 15:136-39, December 1966.

13. What health factors should be considered in the conditioning of boys and girls for athletics?

Those factors concerning health examinations and classification of students for activity have already been discussed. In conditioning, concern is with the maintenance of health and improvement of performance. Adequate sleep, rest, nutrition, freedom from infection and disability, and the "warm-up" are health factors to be considered.

Conditioning implies a gradual increase in the rate and amount (strenuousness) of activity, over a period of time such as weeks, rather than rushing to maximum effort. The application of the physiologic principle of "warm-up" may be analagous to conditioning. As a form of conditioning, it is recommended for each bout of exercise. While the warm-up has not been clearly evaluated (it may not improve performance), it is a factor in promoting "readiness" for activity and competition.[1] It also may be an important factor in injury prevention.

To develop the desired characteristics, such as strength, endurance, agility, and ability, circuit training, interval training, and other forms of increasing activity and applying the "overload principle" may be used.

The proper maintenance of body weight and replacement of water, especially when conditioning in warm climates, is discussed in Part II.

[1] Committee on Medical Aspects of Sports, "The Warm-Up," *Ohio High School Athlete* 27:95, January 1968. Also available from the American Medical Association and the National Federation of State High School Athletic Associations.

14. From a health point of view, should girls and boys participate in the same activities?

Many medical authorities and educators have long agreed that girls can participate in strenuous activities as readily as boys. Girls and women in national and international competition are proof of this fact. They demonstrate high levels of performance in such sports as tennis, swimming, gymnastics, fencing, skiing, ice-skating, and track, to name a few.

Obviously, football, baseball, ice hockey, boxing, and wrestling are physically unsuited to girls and women. They will not want to participate in activities in which the danger of injury, particularly to the breasts or to the face, is pronounced. In females, there is a greater psychological hazard from scars, broken teeth, and other disfigurement.[1]

However, other vigorous sports such as field hockey, lacrosse, soccer, volleyball, basketball, and softball are, if played under rules modified for girls, quite acceptable.

With only a few exceptions, where mixed doubles are possible, as in tennis and badminton, serious competition between males and females is not sanctioned. Before puberty, girls may be athletically superior to their male age-mates. Later, the physical differences in strength, speed, and endurance as well as psychological differences between the sexes must be recognized. (Of course we also must recognize the superior female athlete who may excel over most males.)

However, wherever and whenever possible, coeducational participation in an activity suited to both sexes is recommended. Archery, bowling, dancing, foil fencing, golf, tennis, and badminton are examples.

Girls programs, in any case, need not be merely imitative of programs for boys. The activities, methods, organizational procedures, and rules should be designed to meet the needs of girls and women.

Because of traditional patterns of social mores, girls frequently are not encouraged to participate in strenuous activities. The false beliefs that it is unfeminine, develops unattractive musculature, and has an adverse effect on the menstrual cycle and reproductive organs have retarded the development of much needed physical activity programs for girls. Physical educators, coaches, and physicians should encourage equal activity programs for both sexes.

[1] Higdon, Hal and Higdon Rose, "What Sports for Girls?" *Today's Health* 45:21-23, 74-76, October 1967.

15. Is boxing generally considered a desirable activity for school or college programs?

No. Because of the danger of brain injuries from blows to the head, boxing cannot be recommended as a sport. Educational groups do not generally approve of competitive boxing at either the junior or senior high school level. The NCAA no longer sanctions boxing nor does it conduct intercollegiate championships.

Instruction in boxing is offered at some institutions where headgear and modifications of rules prohibiting head blows are used. Highly qualified instructors and careful supervision are required. Nevertheless, boxing is considered to be a dangerous activity.[1]

School and college programs would do well to offer less hazardous and more acceptable forms of combatives such as wrestling and fencing.

[1] See: Hein, Fred V., "Should Boxing Be Abolished?" *Today's Health* 43:21-23, August 1965.

16. Should showers be taken after participation in activity?

Yes and no. Showers are important for social reasons (body odor, appearance) and for health reasons (removal of bacteria and fungi to reduce infection).

After vigorous activity, older children and adults are often concerned about removing sweat and body odor. Showering can be enjoyable as well as hygienic. The shower also provides an opportunity to "cool off" and quiet down. Shower facilities are desirable when warm water is available and ample time is allowed. Bathing too often with strong soap, on the other hand, can cause dry and irritated skin. Allowance should be made for students who are susceptible to the condition.

Younger children in elementary schools often do not have an opportunity to change clothing. Shower facilities and scheduled time may be inadequate. Under such conditions showering can be undesirable. If they are engaged only in mild activity, showering may be unnecessary. Though younger children are not likely to have the problem of body odor, and relative cleanliness can be maintained by bathing at home, the habit of showering after activity should be developed in these formative years. Thus, the proper conditions for showering should be provided.

Time and clean towels to dry thoroughly should be available. Particular attention should be paid to drying the feet, between the toes, and drying the hair. Before going out into cold weather, the head should be protected.

17. Should students with colds be required to take physical education?

No. During the acute period of a cold, students should be urged to stay at home. Though he may no longer be as infectious to others as during the onset of a cold (medical research has not yet verified all the facts on this aspect of colds), he should be protected from exposure to complicating organisms. In addition to being more comfortable at home, he is likely to be inefficient at schoolwork.

If such students do attend school and go to classes, they should engage only in modified physical education. If possible, they should be kept isolated from other students and excluded from social or other group activities. It is hoped that the school health education program would be directed toward helping pupils and parents understand the advisability of staying away from school when ill as one means of protecting their own health as well as the health of others. From what is known thus far, this is a more realistic means of preventing the spread of colds.

Additional discussion on the subject of communicable diseases appears in Part III, Infection and Disease.

18. What factors need to be considered in determining the desirability of interscholastic competition for youths below the high school (ninth grade) level?

The factors to be considered are primarily those associated with growth and development (physical and emotional), general health, and educational objectives.

From a medical and scientific point of view, interscholastic competition for pre-adolescents — particularly in contact sports — is still an unsettled issue. In the pre-adolescent, the risk of serious injury to the growing epiphyses (end of the long bones of the body) during vigorous activity is recognized. This is cited as a special

hazard in contact sports. The extent of the risk is subject to question, especially since there is little documentation of evidence. Though injuries may occur as often or more so in unorganized activities, responsible authorities will want to protect the student from undue injury. Where such injury does occur, proper diagnosis and treatment considerably reduces the likelihood of permanent injury.[1] Other physical risk factors discussed elsewhere in the pamphlet are also applicable to this age group.

Emotional development is of equal concern to medical and educational authorities. Although experimental evidence in this area is lacking, informed opinion and empirical experience indicate that problems relating to the developing psyche in competition at an early age may be anticipated. Undue stress upon winning, overemphasis on the development of a particular sport competency, and abuse of reward and punishment by overzealous adults, including parents, are among the factors which present emotional hazards to the immature.

The Joint Committee on Health Problems in Education of the NEA-AMA believes that these are good reasons for recommending emphasis on a broad program of intramural sports as the best means of meeting the needs of youth at this age. Opportunities for participation in sports activities should be provided *all* youth.

In either case, interscholastic athletics or intramural activities, the proper safeguards for the young participants must be maintained. These include: proper conditioning; careful coaching; good officiating; right equipment and facilities; and adequate medical care.[2] A similar and highly commendable point of view has been expressed by the AAHPER:

> In those junior high schools in which adequate programs of required physical education, intramurals, and physical recreation are provided for all students, a limited program of interscholastic athletics provides for boys with superior athletic ability additional opportunities fully to develop and utilize this talent. Such programs of interscholastic athletics should be organized and conducted in accordance with the principles outlined below:
>
> 1. The interscholastic athletics program for boys in the junior high school should make definite contributions toward the accomplishment of the educational objectives of the school
> 2. . . . should supplement — rather than serve as a substitute for — an adequate program of required physical education, intramurals, and physical recreation for all students
> 3. . . . should, under the administration and the supervision of the appropriate school officials, be conducted by men with adequate preparation in physical education
> 4. . . . should be so conducted that the physical welfare of the participants is protected and fostered.[3]

[1] Larson, Robert, M.D. and McMahan, Robert O., M.D., "The EpiPhyses and the Childhood Athlete," *Journal of the American Medical Association* 196:607-12, May 16, 1966.
[2] Committee on Medical Aspects of Sports, "Safeguarding the Health of the Athlete," *Tips on Athletic Training VIII*, Chicago, Illinois: American Medical Association, 1966, p. 23.
[3] *Standards For Junior High School Athletics*, Washington, D.C.: American Association for Health, Physical Education, and Recreation, 1963, pp. 16-18.

19. How do factors of child growth and development relate to the determinations of desirable athletics for children and youth below the ninth grade level?

Much of this question is answered in the previous question by implication. Youth at these ages are undergoing rapid growth with consequent physiological and psychological variations. (Witness the differences in size and maturity of twelve year-olds.) Growth is an energy-demanding and vitality-consuming process. Yet, healthy children have abundant energy and an apparent need to expend it in vigorous activity consequent to a need to develop physical skills. It follows that while physical activity is necessary to healthy growth and should not be unduly restricted, neither should it be overdone.

Though children grow through the same pattern, they grow at different rates. Neither chronological age nor size is an indication of physiological or psychological maturity.[1] Even if relatively acceptable indexes of physiological maturity are used by teachers and coaches, accurate psychological determinations are unlikely. For these reasons and those expressed earlier, athletic and physical education programs must be neither too demanding physically and emotionally nor too restricted in the variety of activities made available.

[1] Gallagher, Roswell J., *Medical Care of the Adolescent*. second edition, New York: Appleton-Century-Crofts, 1966, pp. 56-79.

20. What type of activity program is educationally desirable in the late elementary and junior high school years?

Schools at all levels have an obligation to provide all youth an equal opportunity to experience wholesome physical activity as a part of the learning process.

> Adequate programs of physical education are based on the variety of interests, activity needs, abilities, levels of coordination, speed, physical size, and strength of boys and girls. The goals of these programs include developing physical fitness, skill in movement, social and psychological well-being, recreational interests, and interests in activities carried into adult life. In attaining these goals, numerous individual and self-testing activities, dual games, and a variety of team games present opportunities for all students to exercise vigorously, regularly, and enjoyably. . . .
>
> Offering a variety of activities attracts and involves all students, including the temporarily or permanently handicapped. These students may be in greater need of activity programs than other students. . . .
>
> Intramural programs, a logical competitive extension of physical education classes, provide continuing satisfying activity and usually lead to increased skill and fitness. When properly taught and supervised, intramural competition enables boys and girls to gain recognition and self-confidence and to learn how to win gracefully and lose with poise.
>
> In some situations, varsity sports programs are given priority in attention and resources over intramural and physical education pro-

grams. This is undesirable and should not be the case. Each is an important part of the program and should share equitably in facilities and teaching personnel.

Varsity sports activities can benefit the physically gifted student. Even for those individuals, benefits may be limited only to early years since many sports are ordinarily abandoned in later life. For this reason, athletes must also be exposed to a broad range of physical activities. For girls, in addition to physical education and intramurals, varsity programs in sports appropriate to their sex are to be encouraged.[1]

[1] Committee on Exercise and Physical Fitness, "Need for Varied Activities in Physical Education Programs," *Journal of Health, Physical Education, Recreation* 36:6. 8, June 1965; *Philosophies and Standards in Girls and Women's Sports*, Washington, D.C.: AAHPER, 1970.

21. Are contact lenses safe for use in physical education classes and athletics?

Generally, yes. In a sport such as wrestling, lens correction may not be necessary. However, in ball games, uncorrected visual defects can be a handicap and even hazardous.

Though guards or masks should be worn to protect eyeglasses — even "unbreakable" lenses — the problems of fogging and reduced peripheral vision persist. Whether to use eyeglasses or contact lenses depends upon the nature of the vision problem, and the type of activity, and, of course, the individual's preferences. In general, sports participants who require high lens corrections are the best candidates for contact lenses. In any case, the individual and his ophthalmologist can best make the decision. Contact lenses may not only serve to improve visual activity but may also protect the surface of the eye. On the other hand, if they are improperly or unhygienically used, they can cause irritation and infection. The teacher and coach should encourage the contact lens wearer to:

1. Cleanse contact lenses only with the proper solution — not saliva.
2. Take sufficient time during a time out or substitution or half-time intermission to wash hands, cleanse lenses, in order to replace them properly when necessary.
3. Cleanse the lenses properly before re-inserting them if they have fallen out or whenever they become smeared.
4. Wear the lenses a sufficient period before the activity to become accustomed to them.
5. Have a second set of lenses on hand in case of loss during activity.

part 2 Nutrition and Stimulants

Many misconceptions persist about nutrition, smoking, and stimulants among teachers, coaches, students, and athletes. The effect of diet, sweets, alcohol, smoking, and drugs on motor performance are of critical interest to physical educators and coaches. Training rules for athletic competition usually give attention to these practices but they may not be specific. Teachers and coaches have most often asked the following questions:

1. What kind of diet is especially favorable for the conditioning of athletes?

A balanced diet. Athletes and non-athletes require a diet which utilizes the basic four food groups — milk and dairy products, meats, bread and cereals, and fruits and vegetables. *There is no special diet or combination of foods uniquely favorable to athletes in training.*

The amounts of food eaten depend upon the need of the individual. Because they burn more energy, more active people need more food as measured by calories — a measure of energy — to maintain weight. Proteins, carbohydrates, fats, vitamins, minerals, and water are essential nutrients for everyone. A diet of a variety of foods is likely to be a balanced diet.

There are many misconceptions, superstitions, and taboos about special food requirements for athletes. Special high protein diets are unnecessary. Actually, protein requirements are determined by rate of growth rather than activity. Young growing athletes are increasing their muscle mass but so are their non-athletic contemporaries. Both have greater protein requirements than adults. Milk is no more a necessity than any other single food. There is no scientific basis for barring desserts, pastries, and candies from the diet of athletes. Nor should water be withheld. On the other hand, protein and other food deficiencies — over a period of time — can cause problems including impaired motor performance, particularly among those under stress, as are athletes.[1]

While recent research indicates that higher than normal proportions of protein in the diet serve no useful purpose, for endurance events, carbohydrates might be emphasized. If available during strenuous activity, there is an increased utilization of carbohydrates.

The athlete needs at least three meals a day. Breakfast is an important meal if the levels of efficiency are to be maintained.

Feeding an athlete is basically no different from feeding a normal non-athlete. The best diet is a balanced one, consisting of a variety of enjoyable foods in amounts that maintain optimum weight levels.

[1] Canham, John E. and Consolazio, C. Frank, "Nutrition and Stress," *Proceedings of the Seventh National Conference on the Medical Aspects of Sports,* Chicago: American Medical Association, 1967, pp. 64-70.

2. Should athletes use food supplements to increase efficiency?

Given an adequate amount and variety of good food, supplements of vitamins, gelatin, sugar, honey, yogurt, or wheat germ make no significant difference in athletic performance. Extra vitamins beyond daily needs serve no useful purpose. In individual cases a metabolic or nutritional condition may require the administration of vitamins. But these can only be ascertained by a physician.

Gelatin is just another food and has no particular virtue for athletes. In fact, because it does not include all of the essential amino acids, it has less value than several other protein foods.

Taking a little sugar, such as dextrose, may give a little "lift" in a very few minutes. This is probably no more than a psychological effect. However, in very long events such as marathon runs and channel swims the replacement of sugar becomes more important because the body reserves are likely to be depleted in such events.

Honey is mostly another form of sugar. Yogurt is merely a more expensive form of milk and is of no greater value. Claims for the value of wheat germ oil supplements in enhancing performance have not been substantiated.

3. Are there any benefits from coffee, tea, or soft drinks?

Neither coffee, tea, nor soft drinks have any noteworthy or special virtues as additions to the diets of athletes. The use of caffeine for a lift is relatively harmless if it is not used when food or rest are more important. Caffeine apparently has a much greater effect on some people than on others. There is evidence that after continued use it loses its power to stimulate.

Soft drinks, coffee, tea, and candy are particularly undesirable when used as substitutes for food.

4. Should there be a "special" pre-game meal?

Contrary to popular belief, a special meal that is heavy in protein, such as steak, is of no particular benefit. As a matter of fact, a carbohydrate meal appears to be more beneficial since it makes available fuel for energy. Protein does not enhance performance. It requires oxygen for metabolism which might better be utilized by muscles in activity; it draws water for excretion that might otherwise be drawn as perspiration.[1] Thus, protein increases the load on the kidneys.

A high fat diet takes longer to digest and requires extra oxygen over a longer period.

Due to the emotions generated by competition, pre-game meals are usually spaced three to four hours before the contest.[2]

[1] Mayer, Jean; Bullen, Beverly; and Pollack, Herbert, "Nutrition For the Athlete," *Proceedings of the Second National Conference on the Medical Aspects of Sports*, Chicago: AMA, 1960, pp. 51-52.

[2] See: Rose, K. D. and Fuenning, S. I., "Gastrointestinal Mobility and the Feeding of Athletes," *Nebraska Medical Journal* 45:575-79, 1960.

5. Should physical education classes be scheduled immediately after lunch?

It depends on the activity, the individual, and the size of the meal. Farmers and industrial workers often resume heavy labor immediately after eating. School children, waiting for afternoon classes to begin, play hard without apparent deleterious effects.

An overloaded stomach, however, does interfere with downward movement of the diaphragm. This is often responsible for an uncomfortable feeling and leads to early breathlessness. Strong emotions such as precede and accompany exciting competition reduce the normal movement of the empty stomach (hunger contractions) and the full stomach (digestive movements). This explains why an excited child does not feel hungry and why, if he does eat, digestion may be retarded.

Some individuals become nauseous after a heavy lunch while performing strenuous activities such as wind-sprints or swimming races. Activities in which strong stomach muscle contractions are required may be discomforting. If scheduling physical education classes after lunch is necessary, allowances should be made for individual reactions. Competition, generating strong emotions, and activities involving a high degree of physical stress should be avoided. Moderate activities should present no problem.

6. Are swimming classes advisable immediately after lunch?

In addition to the considerations in the preceding question on scheduling physical education classes after lunch, it must be recognized that beginning or inexperienced swimmers are often tense and afraid. Therefore, it is wise to wait at least an hour before strenuous swimming.

In a study of university men and women, a cereal and milk meal, one half, one, and two hours before swimming was reported to have no adverse effect on swimming times in the 200 and 400 yard freestyle swim. Subjects reported no nausea or stomach cramps.[1] Note that this was a relatively "light" meal.

There is no scientific basis for the belief that drownings or near drownings occur as a result of swimming too soon after meals. Also, there is no such thing as "stomach cramps" which cause drownings. Muscle spasms or "cramps" such as those that occur in the feet and calves can occur at any time. Panic, inexperience, or poor judgment, and inability to swim well are more important hazards.

[1] Asprey, G. M.; Alley, L. E.; and Tuttle, W. W., "Effect of Eating at Various Times on Free-Style Swimming Performance," *Journal of the American Dietetic Association* 47:198-200, September 1965. See also the same authors' article, "Effect of Eating at Various Times on Subsequent Performances in the One-Mile Freestyle Swim," *Research Quarterly* 39:231-34, 1968.

7. Should exercise be recommended for weight reduction?

Yes, for those who are overweight, except where inadvisable for medical reasons. Overweight is usually a consequence of too much food intake and too little activity — excessive caloric imbalance. Exercise consumes food energy, calories. Few people can be comfortable on a diet low enough in calories to lose weight.

Studies have demonstrated that obese girls do not necessarily eat more than their normal weight peers but are less active.[1] For this and other reasons physical education programs are recommended for girls and exercise is usually recommended for those who wish to lose or control weight.

Nutritionists suggest daily allowances as low as 2400 calories for inactive men and as high as 6000 for very active men. A well-conditioned athlete can easily endure activity which will expend 500 calories an hour.

Maintenance or changes of weight are based on the balance of energy input and output. Since a pound of fat represents approximately 3500 calories, a reduction in daily caloric intake of 500 calories below maintenance levels should result in a loss of one pound per week. Similarly an increase in energy output of the same amount should attain similar results. A combination of the two techniques should prove more effective. However, such progress is not always steady and persistence is necessary.

Obesity may result from different physical and psychological factors. The physical educator is not qualified to prescribe the treatment of obesity. Crash diets or schemes to promote rapid or sudden weight losses are extremely hazardous. Prescription of diet and exercise for the obese individual should be a result of medical evaluation.[2]

[1] For example: Bullen, B. A.; Reed, R. B.; and Mayer, J., "Physical Activity of Obese and Non-Obese Adolescent Girls Appraised by Motion Picture Sampling." *American Journal of Clinical Nutrition*, 14:211, April 1964; Corbin, Charles B. and Pletcher, Philip, "Diet and Physical Activity Patterns of Obese and Non-Obese Elementary School Children, *Research Quarterly* 39:922-28, 1968.

[2] See also: Committee on Exercise and Physical Fitness and President's Council on Physical Fitness, *Exercise and Weight Control*, Chicago: American Medical Association, 1967, pamphlet.

8. Does strenuous exercise damage a healthy heart?

Strenuous exercise has never been shown to damage a healthy, sound heart in a properly conditioned player.

There is no such thing as an "athletic heart," that is, a heart that has been damaged by participation in athletics. Hearts may be damaged by disease, not work. "Enlarged hearts" are not always damaged hearts. Merely because a heart in a particular athlete is larger than that found in another person of comparable height and weight does not indicate that the enlargement is abnormal or likely to be dangerous to that person.

Most significant of all, however, is the fact that the functioning of every heart presents an individual problem and thus, coronary

disease, in both its preventive and treatment aspects, is a highly individual matter. Generalizations about "heart disease" and athletics are not, therefore, sound. Of interest to physical educators is the increasing application of exercise programs in the rehabilitation of patients with certain types of heart disease.[1]

Teachers should observe the following signs in children and adolescents and encourage them to report these symptoms in themselves: (1) pounding heart, breathlessness, or extreme weakness or shakiness that persists for more than ten or fifteen minutes after exercise; (2) restlessness and broken sleep in the night following strenuous exercise; or (3) a sense of definite fatigue carried into the next day. If any of these are reported by the pupil or noticed by the teacher, the inidivdual should be examined carefully by a physician.[2]

[1] Bugg, Ralph. "They're Mending Hearts With Exercise," *Today's Health* 45:50-55, October 1967.
[2] For additional discussion on screening students' physiologic response to exercise see Part I, question 3.

9. How much water should a person who exercises drink? When?

The active person, in serious training or otherwise, should drink as much water as he needs. Ordinarily, thirst is a dependable gauge for the need of water. Fluid intake beyond normal demands or withholding of water does not improve athletic performance.

Water should be readily available, particularly in hot weather. During strenuous activity or during competition, to avoid nausea or loss of playing efficiency due to discomfort, only about a glass of water should be taken at any one time. Thirst and comfort are important determinants.

Salt replacement is important in the hot season. Extra salting of foods at meals is usually sufficient for this purpose. The use of salt tablets, which may cause upset stomach, or salinated water on the field is not necessary — water replacement is. For additional discussion of heat problems and water intake, see question number 11 in this section.

10. Is the practice of "drying out" athletes to make weight, as practiced in wrestling, desirable?

Certainly not. Dehydration over several days will produce fatigue which will reduce efficiency. Rapid weight loss which threatens proper salt and fluid balance is dangerous.

The Committee on Medical Aspects of Sports says:

> In wrestling, abuses in weight control primarily stem from dehydration measures, including, but not limited to, hot boxes, rubberized apparel, and induced vomiting. The body's water is the only weight that is easily lost and that can be lost in a day or two. However, water

is a nutrient. In fact, water deficiency causes premature fatigue, and eventually clinical illness, more rapidly than deficiency of any other nutrient. If to a water deficiency other deficiencies are added, such as those associated with prolonged semistarvation diets, unbalanced diets or excessive sweating, the deleterious effects are even more marked.

Any form of dehydration is self-defeating to a wrestler. Even with minimal dehydration (e.g., sudden loss of 3% body weight), performance can be impaired . . . .

. . . . effective weight of wrestling candidates can best be assessed through a natural approach:

1. Educate youth interested in athletics as to the importance of periodic medical examinations and the advantages of a general, year-round conditioning program for cardiovascular-pulmonary endurance, muscular fitness, and nutritional readiness.
2. Building on this orientation, assist any aspiring wrestler in an intensive conditioning program related to the demands of wrestling for at least four weeks, preferably six, without emphasis on weight level.
3. At the end of this period and without altering his daily routine, take his weight in a pre-breakfast, post micturation state.
4. Consider this weight his minimal effective weight for competition as well as certification purposes.
5. Educate the boy and his parents in the concept of defensible weight control to avert fluctuation from his effective weight level." [1]

[1] Committee on Medical Aspects of Sports, "Wrestling and Weight Control," *Journal of the American Medical Association* 201:541-43, August 14, 1967.

11. Are heat exhaustion and heat stroke serious problems? How are they prevented?

Indeed they are serious. In recent years football players' deaths due to heat stroke have increased from fifteen in the period from 1931 to 1963 to eleven in the succeeding three years. Heat stroke is associated with heavy training in hot, humid weather, unacclimated athletes (particularly those leaving air-conditioned environments), and heavy or "airless" uniforms. Deaths are a result of overheating due to a breakdown of the sweating mechanism. Heat exhaustion is due to failure to replace water and salt. Excessive water and salt loss can lead to heat stroke.

Emergency procedures are:

Heat Stroke — Collapse WITH DRY WARM SKIN indicates sweating mechanism failure and rising body temperature. THIS IS AN EMERGENCY AND CAN BE FATAL.

Immediately cool athlete by the most expedient means (immersion in cool water is best method). Obtain medical care at once.

Heat Exhaustion — Weakness WITH PROFUSE SWEATING indicates state of shock due to depletion of salt and water. Place in shade with head level or lower than body. Give sips of dilute salt water. Obtain medical care at once.[1]

Fortunately, these conditions can be prevented. The Committee on Medical Aspects of Sports advises:

1. Require a careful medical history and checkup prior to the beginning of practice.
2. Schedule workouts during cooler morning and early evening hours in hot weather.
3. Acclimate athletes to hot-weather activity by carefully graduated practice schedules.
4. Provide rest periods of 15 to 30 minutes during workouts of an hour or more in hot weather.
5. Supply clothing that is white to reflect heat; brief, loose, and comfortable to permit heat escape; and permeable to moisture to allow heat loss via sweat evaporation.
6. Furnish extra salt and water in recommended amounts during hot weather.
7. Watch athletes carefully for signs of trouble, particularly interior linemen and the determined athlete who may not report discomfort.
8. Remember that temperature and humidity, not the sun, are the crucial factors. Measuring the relative humidity, by use of a sling psychrometer on the field, is advantageous in this regard. Heat exhaustion and heat stroke can occur in the shade.
9. Know what to do in case of such an emergency, including immediate first aid practices and prearranged procedures for obtaining medical care.
10. Outlaw the hazardous warm weather use of rubberized apparel or other dehydration devices by players.[2]

[1] Committee on Medical Aspects of Sports. "First Aid Chart for Athletic Injuries," *Tips on Athletic Training VIII*, Chicago, Illinois: American Medical Association, 1966.
[2] Committee on Medical Aspects of Sports. "Hot Weather Hints," *Tips on Athletic Training VIII*, Chicago: American Medical Association, 1966, pp. 6-8.

12. Is there any new evidence that smoking is an undesirable practice for boys and girls participating in strenuous activities?

There is much more than experience to support physical education teachers' and coaches' traditional stand that smoking is an undesirable practice. In the interests of health—the promotion and maintenance of the health of the students — teachers must recognize and inform young people about the health hazards of smoking.

Before and since the Surgeon General's Report on Smoking and Health, studies have associated the long-term (and, in some instances, short-term) smoking habit with various diseases such as chronic bronchitis, emphysema, lung cancer, and heart disease.[1] No one can support smoking as a contribution to health.

Insofar as performance is concerned, studies have indicated smoking has a detrimental effect on those engaged in endurance activities.[2] Its effects on activities of a short duration are not statistically as apparent. But consider the following:

1. Cigarette smoke aggravates changes in the pathways to and in the lungs.
— Ten inhalations of cigarette smoke have been found to increase resistance in lung air pathways by as much as 50% and for as long as an hour for both smokers and nonsmokers.
— Decreased maximum breathing capacity and increased residual volume of air in the lungs have been demonstrated from tests on heavy smokers.
— Athletes who smoke have been found to be superior in vital capacity compared to non-athletes but were inferior in this respect to nonsmoking athletes.
— The membranes that line the air passages of smokers are thickened and abnormal; the membranes' hair-like cilia are inert or ineffective in removing toxic agents introduced into the pulmonary system.
— Teenagers who smoke, occasionally or regularly, have nearly three times as many severe upper respiratory tract infections as their non-smoking peers.
2. Cigarette smoking is associated with changes in cardiovascular functions.
— The diffusibility of oxygen in the lungs is significantly decreased among regular smokers.
— The heart rate of healthy young men who smoke is significantly higher than nonsmoking peers, both before and after exercise.
— Tobacco smoke produces constriction of peripheral blood vessels in the majority of subjects tested; some show a slowing or cessation of blood flow through the capillaries during and after smoking.

The young athlete can be told that these findings may not apply to occasional puffs, hours away from a game or practice session. He should realize, however, that once he starts to smoke, the chances of limiting himself to an occasional puff are small indeed. He needs this perspective to support a decision not to start.[3]

[1] Advisory Committee to the Surgeon General, *Smoking and Health*, Washington, D.C.: U.S. Government Printing Office, 1964.
[2] For example: Cooper, Kenneth H.; Gey, George O.; and Bottenberg, Robert A., "Effects of Cigarette Smoking on Endurance Performance," *Journal of the AMA* 203:189-92, 1968.
[3] Committee on Medical Aspects of Sports and National Federation of State High School Athletic Associations, "Cigarettes and Athletic Fitness," *Ohio High School Athlete* 27:37-38, November 1967.

13. Why is the use of alcohol prohibited in the training program of athletes?

Contrary to popular belief, alcohol is a depressant and not a stimulant. The immediate effect of alcohol, even in relatively small doses (one ounce of whiskey or one bottle of beer), is to reduce the activity of nerve centers. In fact, alcohol acts much like an anesthetic such as ether or chloroform. It affects the finest and most delicate coordinations first. These include powers of judging distance, speed, depth perception, and delicate movements of the tongue and hand.

Because the dilution and oxidation of alcohol in the body is a function of fluid volume and size, growing youngsters are affected more than larger adults. Larger amounts of alcohol progressively break up grosser coordinations with consequent loss of efficiency

and balance. Double vision also occurs. Alcohol reduces alertness to one's surroundings, reducing powers of observation. Nervous inhibitions are removed enough so the individual performs in an uninhibited, less restrained, and less coordinated manner.

Abstaining from drinking sufficiently before athletic performances removes the hazards of the aforementioned effects. However, the irresponsible use of alcohol by minors and athletes cannot be advocated either during training periods or otherwise. There are possible problems of caloric and nutritional imbalance to be considered; reduced effectiveness during training and conditioning sessions; the hazard of accidents in the gymnasium and on the playing field; and irresponsible social behavior, all of which are associated with drinking alcoholic beverages.

While it is not realistic to condemn the moderate use of alcohol in a proper social context, its use cannot be condoned for the young serious athlete.

14. Are "pep pills" used in athletics? Are they useful or harmful?

"Pep pills" or amphetamines are drugs which, if misused or abused, can be harmful, even fatal. Along with other drugs or so-called "ergogenic aids" they are considered as "dope," which according to the rules of sport is illegal. Obviously, the practice of doping athletes (like race-horses) is unsportsmanlike and defeats the purposes and values of athletic programs.

Ergogenic aids are supposed to eliminate fatigue symptoms and thus increase the capacity of physical and mental performance. Fatigue is a natural and essential warning that the body is reaching its capacity for work. Blocking fatigue with pep pills can cause the athlete to prolong performance until the body is dangerously overstressed. In France, fatalities have been reported among marathon cyclists using ergogenic aids. Furthermore, these drugs which affect the central nervous system can disturb coordination, timing, and judgment.

Some studies contend to have demonstrated that amphetamines improved performance in running, swimming, and weight-throwing events.[1] More recent studies stand in opposition.[2] In view of the aforementioned, authorities agree that ergogenic aids have no place in sports.

> Whether done unknowingly, tacitly, secretly or openly, the use of unwarranted ergogenic aids in sports is to be unequivocally condemned for the following reasons:
>
> 1. *Health.* Such practices can be harmful (in wrong dosage some are toxic); all detract from sound principles of diet, condition, and daily living.
> 2. *Education.* The athlete is taught erroneously to rely on factors other than healthful living, the physiology of activity and sportsmanship.
> 3. *Achievement.* Reliance on "gimmicks" does not contribute to de-

velopment of mental or physical readiness, but more likely to a temperamental attitude and inconsistent performance.

4. *Economics.* The already strained budget for school athletics is further burdened with items that are not essential to safe and healthful participation in sports.[3]

In addition, it is compelling to note that these drugs such as amphetamines can be habituating and are illegal without medical prescription. Moreover, the illegal use of pain-deadening drugs is not without hazard. Heroin, for example, which is a severely addicting drug, has been known to be illegally used by athletes to raise the threshhold of pain. At least one death in recent years occurred due to an apparent overdose.

[1] Smith, Gene M. and Beecher, Henry K., "Amphetamine Sulphate and Athletic Performance," *Journal of American Medical Association* 170:542-77, May 30, 1959; in the same issue: Karpovich, Peter V., "Effect of Amphetamine Sulphate on Athletic Performance," pp. 558-61.

[2] Novich, Max M., "Doping in Sport," *Abbottempo* 2:26-29, May 15, 1964.

[3] Committee on Medical Aspects of Sports and National Federation of State High School Athletic Associations, "Ergogenic Aids," *Tips on Athletic Training VII*, Chicago: American Medical Association, 1965, pp. 8-10.

part 3 Infection and Disease

To share in the prevention of infection and disease is one responsibility of the physical educator. As a consequence of his mission he must feel responsible not only to protect his students' health, but to promote it. His understanding of the conditions related to the causes of infectious diseases, establishment of sound health standards, enforcing their observations, and providing an example of personal hygienic practices can encourage continuing healthful behavior among students. To help them meet this responsibility, physical educators have asked such questions as these.

1. How may infections be spread through physical education activities?

Unsanitary practices in physical education and athletics can spread infection. The use of common towels, drinking cups, and beverage bottles; sucking common sponges, oranges, and other articles; and wearing each other's clothing, supporters, socks, and other apparel are some examples. Infection may also occur through the use of unclean towels, mats, and other equipment. Close contact between players, particularly as they use equipment in common, facilitates the transmission of infection.

Drinking fountains, individual drinking cups, or portable sprayer fountains should replace the common sponge or dipper. The excitement of a game may cause players, athletes, and coaches to relax sanitary precautions which would ordinarily be maintained.

Students and athletes should be taught the principles of immunity. Muscle strength or size does not provide protection from infection. Invading organisms, such as viruses or bacteria, are fought with immunological processes and not muscles. Resistance to diseases may be enhanced by an adequate diet, sufficient rest, and sanitary practices. Immunity to some diseases can be developed naturally, by once having the disease, or artificially, by vaccination. Everyone should maintain his immunization schedule.

2. Which immunizations should student-athletes have?

Immunizations for admission to school are required by law in many states. Vaccinations, for active immunity, have included smallpox, diphtheria, tetanus, pertussis (whooping cough), and poliomyelitis. Artifically acquired immunity for the measles (rubeola), or the "seven-day measles," has more recently been available.

Though immunization against *measles* is not a widespread legal requirement for entering school children, it is highly recommended. Those students who have not had naturally acquired immunity by having had the disease should be protected by a measles vaccine. This disease is commonly considered harmless, but serious complications sometimes leading to brain damage occurs in about one of every six cases.

Tetanus, or lockjaw is not a common disease, but approximately half of its 400-500 annual cases are fatal. The high mortality rate and the prevalence of tetanus bacteria in the soil of playing fields warrants considerable attention. To maintain immunity to tetanus, individuals should receive tetanus toxoid every ten years. A booster dose will probably be necessary with an injury involving deep puncture and lacerations.

Smallpox and *diphtheria* are no longer the scourges they once were in the United States. However, with international travel, the re-introduction into this country of smallpox, a potentially severe disease, is quite possible. Vaccination should be maintained every five years. Diphtheria outbreaks occasionally occur. A proper vaccination schedule for diphtheria, tetanus, and pertussis should be maintained. For older students, the vaccine for pertussis can be omitted.

Poliomyelitis immunization is relatively simple to maintain. The oral vaccine in widespread use is easy to take and develops a long term immunity. Everyone, particularly youngsters, should be immunized. Occasional outbreaks of this potentially crippling disease still occur. Once immunized with Sabin live virus vaccine, it is not yet known when reimmunization for polio will be required. The Salk vaccine is short-lived and requires boosters.

Influenza immunizations are not universally recommended. Primarily it is used, prior to anticipated epidemics, to reduce the severity of the disease. The aged and infirm, and other susceptibles for whom the disease is hazardous, are target groups. Team physicians or family physicians may recommend immunization, in the event of a possible epidemic, for those who associate with groups of people or crowds and whose performance requirements are demanding.

Mumps immunization may be recommended for older children, adolescents, and adults — particularly males — if they have not had this disease. The duration of immunity by vaccination is not yet established. A schedule for booster doses should be maintained in consultation with the regular physician.

Typhoid, yellow fever, and *cholera* immunizations should be considered for international travel. *Rocky mountain spotted fever, Q fever, anthrax, brucellosis, rabies* and *tularemia* are hazards of certain localities in the U.S. When exposure to these diseases is suspected, physicians may recommend appropriate immunization procedures.

3. How are colds and influenza transmitted?

Transmission can occur through unsanitary practices including: contact, sneezing, coughing, spitting, talking with persons with colds, using common towels, drinking cups, and other means described in question one. Clean and individual towels and drinking cups or modern drinking fountains should be provided.

Team physicians may also recommend immunization against certain types of influenza for all team members. Students with colds should be kept home, resting. With influenza they are more likely to require medical supervision. In any case, they should not be permitted contact with other class or team members. Upper respiratory symptoms similar to the "common cold" may actually be the initial stage of more serious infectious and contagious diseases.

4. What infections are likely to be most devastating to an athletic team?

There are a number of "devastating" infections for physical education students as well as athletes. Some of these are colds, influenza, mumps, measles, infectious mononucleosis, boils, impetigo, herpes simplex, and ringworm. An epidemic of colds or influenza has caused many a fine squad to forfeit its chances for victory. Other infections feared by coaches are mumps and measles which are often mistakenly considered as trivial "children's diseases."

For those students and athletes who have not had the measles, a vaccine to provide immunity is currently available and highly recommended. A vaccine for German measles is also now available and highly recommended, especially for girls.

Any boy or girl with symptoms of a cold or other respiratory infection, or in whom any elevation of temperature is suspected, should be promptly excluded from participation in physical activity and advised to seek medical attention. When no medical opinion is immediately or routinely available, it is best to exclude the player from participation and isolate him from his associates.

Permitting or encouraging an ill player to participate in vigorous activity such as athletic contests and then eulogizing him for this supreme effort is inexcusable. It is hazardous to health and, in some cases, even to life. Besides, a well substitute is always a better risk for the team and the coach than a sick regular.

5. Is exercise or a stiff workout beneficial to curing infection?

No. It is axiomatic that a person suffering from any infection should take it easy. Exercise, and particularly a strenuous workout, may cause the infection to spread with more serious effect. The individual should not participate in any activity which will subject his body physiology, and particularly his heart or lungs, to strain. Bruising injuries to a boil or wound infection may cause serious problems.

A currently popular theory that "a mild workout" for a "mild, feverless cold" makes one feel better and cures the cold is at its best a dangerous judgment. It is wholly inadvisable to "work out" a cold, and strenuous activity should not be permitted while suffering from the effects of one, unless medical clearance has been given. Rest, preferably bed rest, is of great importance in the treatment of respiratory diseases.

6. Is there much danger of infection from floor or mat burns or other abrasions and wounds encountered in physical activity?

Yes. Any wound in which the protective layer of the skin is broken or abraded in the presence of dirt risks infection. This risk exists particularly when mats, which are walked upon by street shoes and dragged across floors, are not regularly cleaned.

All floor and mat burns should be carefully and thoroughly washed with soap and water. Scrubbing the wound with a clean soaped wash cloth or gauze pad may be necessary to remove dirt and germs ground into the tissue. It is important, therefore, that mats be kept as clean as possible. Vinyl plastic covers for padded canvas mats and newer lightweight high impact composition-foam mats are more easily washed and kept clean.

All students, and particularly athletes, should be immunized against tetanus. Since immunizations are not life-long, students should be expected to maintain a recommended immunization schedule preferably through their family physician. The possibility of tetanus and gas gangrene infections must be considered when dirt from the playing field enters a wound. Open lesions must at no time be sealed by the use of an ointment or an airtight bandage. The absence of air favors the development of these infections.

First aid must remain first aid. Whether an antiseptic or even medicated soap should be part of first aid in physical education and athletics should be determined in advance by the school medical adviser or a committee of the local medical society. Their policies should be followed by teachers, coaches, trainers, and school nurses. Insofar as first aid is concerned, it is recognized that careful cleansing with soap and water provides all the necessary protection against infection. Deep cuts and lacerations should be treated by a physician.

7. What is *herpes simplex* and is it hazardous?

Herpes simplex is a virus infection. Most commonly it occurs in skin or mucous membranes sometimes in the form known as "cold sore" or "fever blister" on or near the lips. It can affect the cornea of the eye and the genitalia. Less commonly it is a systematic illness with symptoms of chills, fever, and headache. About the mouth it is essentially a nuisance and may lead to secondary infection. It is potentially hazardous and may be associated with another infection.

In physical activities involving close physical contact, such as wrestling, herpes infections are more readily transmitted. The organism is probably introduced through broken or injured skin. Once infected, recurrent outbreaks can occur.

Teachers and coaches should be alert to the appearance of blistered skin eruptions which appear on the face and forearms of students, and particularly wrestlers. Eruptions may appear anywhere, though other common sites are the genital area and the buttocks.

Another skin infection with blister-like lesions is *impetigo*. However, these blisters later become crusted, pus-like plaques. This highly contagious condition is caused by staphylococci bacteria which also cause boils, carbuncles, and infected lacerations and abrasions. Control of the spread of the infection is maintained by having the physician confirm the condition; isolating the infected person from direct contact with teammates while he is recovering; and enforcing hygienic standards for everyone at all times.[1]

[1] For additional information, see: "Sports Contributions," *Journal of the American Medical Association* 194:993-1002, November 29, 1965.

8. What is the "itch" commonly associated with athletic supporters?

"Itch" from supporters represents, in most cases, skin irritation or abrasion from friction. Such irritation may be particularly associated with dirty or infrequently laundered supporters. On occasion, this relatively mild disturbance may be complicated by a fungous infection.

Tinea cruris is the medical term for "ringworm" — fungous infection — of the groin also known as "jockey itch." Another form of itch, noted for its intensity particularly at night, is *scabies*. This infectious disease is caused by a crab-shaped mite which penetrates the skin. Severe scratching can lead to secondary infection. These discomforting and irritating conditions should be treated by a physician.

All primary reactions or skin irritations should receive prompt attention. When brought to the attention of the physical educator or coach, he should recommend cleanliness, appropriate drying, and perhaps the application of talcum powder. Sometimes temporary suspension of activity is advisable. Attention should be directed to correction of defects in the supporter, such as stiffness of the fabric or improper fit. Medical attention is necessary if the reaction persists or becomes aggravated.

A superstitious practice to be emphatically discouraged by the coach is the wearing of the same unclean articles of clothing during a "winning streak." Winners can become losers because of this unsanitary and irrational belief.

9. Are boils transmissible among participants in physical activities?

Yes, probably because of some of the unsanitary practices discussed previously. Boils are caused by a germ — usually a staphylococcus — which may readily be passed from one player to another as players make contact with each other. More often the germ is transmitted from dirty clothing worn next to the skin. All lesions should be treated by a physician.

Wherever possible, adhesive tape should not be used on the skin to hold boil dressings in place. Irritation of the skin caused by the tape frequently cause spread of the boils.

The frequent washing of clothing, uniforms, and towels, and the dry cleaning of hip pads, head gear, and all other equipment that permit such treatment are worth more than the additional cost. If the equipment cannot be so cleaned, it must not be worn next to the skin.

Individuals with boils should be kept out of active participation in sports and from use of dressing rooms and showers. All participants in physical education activities should be particularly careful in keeping clean. Warm showers (not to exceed 120 F) with soap should be taken after activity.

10. What is ringworm of the foot and what can be done about it?

Ringworm of the foot is not a "ringworm" at all, though it often appears as a ring-shaped skin inflammation. Infection by certain types of fungi is technically known as *epidermophytosis* or *dermatophytosis* or *tinea pedis*. When dermatophytes infect the foot, usually between or around the toes, it is commonly called "athletes foot" — probably due to its association with shower rooms, swimming pools, and locker room. This fungous infection may appear on the hands and other parts of the body. The skin condition it causes — blistering, weeping, cracking, and severe itching — is annoying, painful, and sometimes serious. Secondary bacterial infection can complicate the condition.

Tinea pedis is a common infection. The dermatophytes are found mostly in moist environments and the spores remain dormant for long periods. Daily or frequent thorough washing or hosing of shower room, drying room, and locker room floors is recommended to reduce the number of dermatophyte colonies.[1]

Studies have shown that footbaths with disinfectants have not been particularly effective in preventing tinea pedis.[2] Footbaths are no longer recommended because they easily become unsanitary and unsightly. They may produce a false sense of security and reduce proper personal care of the feet.

Physical educators and coaches should insist on hygienic maintenance of facilities and encourage preventive personal foot care:

1. Wash feet carefully with soap and water, particularly between the toes, after physical activity.
2. Dry the skin thoroughly particularly between and around the toes, remove dead or macerated skin.
3. Dust the feet with talcum or medicated powder.
4. Wear clean dry socks and properly fitted, well-ventilated shoes.

Teachers should assist in the identification of students who have fungous skin diseases by observation and by being alert to com-

plaints of itching and discomfort. Those with suspected fungous disease should be referred to their physician for treatment. Self-treatment is inadvisable and sometimes hazardous. Treatment of tinea pedis or other diseases is not a function of school personnel.

[1] Gip, Lennart, "Investigations of the Occurrence of Dermatophytes on the Floor and in the Air of Indoor Environments," *Acta-Dermato-Venerelogica* Vol. 36, Supplementum 58, 1966, pp. 1-54.
[2] Baer, Rudolph L. and Rosenthal, Stanley A., "The Biology of Fungous Infections of the Feet," *Journal of the American Medical Association* 197:1017-20, September 19, 1966.

11. Are acne or pimples "catching"?

No, but control measures for acne or pimples are similar to those for boils in cases where the lesions are superficial, although the condition is far less dangerous. Obviously, care should be taken to prevent the spread of pus of any sort. Acne is associated with endocrine changes in adolescence: an increase in the secretion of sebum, an oily substance, by the sebaceous glands of the skin; the clogging of the sebhorric ducts; and the entrapment of dirt leading to infection.

Like boils, acne requires the attention of a physician. The control of the disease may be of great importance to the individual for social and cosmetic reasons, but the disease carries little menace to the other members of the class or squad unless there is secondary infection as evidenced by the presence of pus.

12. What is "swimmer's ear"?

An ear infection common among those who swim frequently during the hot summer months is *otitis externa*, known as "swimmer's ear." The exact cause of the infection is uncertain because both bacteria and fungi are found in the ear canal. Ear drops prescribed by a physician can help clear up the infection and also be used prophylactically to help prevent re-infection.

13. Is *poliomyelitis* still a hazard and can it be spread through swimming or wading pools?

Poliomyelitis is no hazard to those who have been properly immunized against it. Every child and school teacher should be vaccinated against polio. Many states require polio immunization as well as diphtheria, smallpox, tetanus, and pertussis (whooping cough) for admission to school.

In the past, polio epidemics were associated with the summer season, swimming pools, and strenuous activity. Fatigue and chilling may have an adverse effect on susceptible persons exposed to polio and may be responsible for the difference between a relatively mild case and one that is seriously crippling.

Polio vaccines are available and effective. If all children are properly immunized against polio, the disease will be kept under continuing control.

14. Can venereal diseases be transmitted during physical activity or contracted indirectly as in toilet rooms?

The possibility of contracting a venereal disease by indirect contact is remote for older children and adults. The organisms which cause venereal diseases, such as *syphillis* and *gonorrhea,* do not survive more than a few moments in the open air.

Normally, venereal diseases are transmitted by intimate sexual contact. When there are extragenital chancres — open sores of syphillis — on the hands or lips, skin-to-skin contact in some sports activities may facilitate transmission. Such cases are rare.

Venereal diseases are dangerous physically, emotionally, and socially. Teachers and coaches can make a contribution to reducing the current epidemic of VD among adolescents and helping control the disease. They should provide correct and adequate information about the disease, how it is prevented and contracted, and the necessity for medical attention when its presence is suspected.

In the pre-adolescent or elementary aged female, gonorrheal vaginitis may be spread through indirect contact such as soiled towels previously used by an infected person.

15. What is the best way to clean towels and swimming suits to make certain that disease carrying organisms are destroyed?

Studies have shown that heat is the best method. Washing towels and suits in water at 180 F for approximately 20 minutes will make them sanitary. Quaternary ammonia (ammonium chloride) compounds are good cleaning agents. Chlorine compounds may be used for white clothes, but are not safe for rayon and some other synthetics. Applications of high heat for sufficiently long periods of time will adversely affect resistant fungus spores. Chemical cleaning agents are not as effective as heat.

Each of the answers appearing in this brief publication can be supported and developed further. For additional information in these and other areas of health related to physical education, see the footnotes cited and the following references.

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