REFRESHER COURSE FOR GENERAL PRACTITIONERS SPECTACLES

BY

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Some general practitioners are endowed with enough special knowledge of ophthalmology to decide whether their patients need spectacles and, if so, to carry out the tests whereby the proper strength of glass can be ascertained. Such an arrangement has obvious advantages, but those who aspire to enter general practice find the time for training all too short. If they have a year to spare after serving as casualty officer, house-physician, and house-surgeon, most of them will be inclined to seek extra experience in obstetrics, paediatrics, or other branches of medicine closely linked with general practice. Only a minority will find time to familiarize themselves with refraction and ophthalmoscopy. Nevertheless all qualified practitioners who attend families, schools, factories, offices, and Service units are responsible for advising examination of their patients' eyes. They seldom need to concern themselves with the merits of rival examining techniques, but they must see that refractive defects are investigated and appropriate prescriptions given. Most of them have a healthy objection to their patients being saddled with unnecessary glasses.

Functions of Spectacles

Before considering some of the questions which frequently arise concerning spectacles, it is appropriate to emphasize what are the main purposes which these appliances can fulfil. First and most obvious is the provision of clear images. Thus to a patient afflicted with several degrees of myopia (short-sightedness) all objects more than a few inches away will appear misty, unless his refractive error is counteracted by concave spectacles. Secondly, spectacles are an important item in the treatment of squint and other disorders of ocular muscle balance. In such cases it will often happen that the glasses incidentally permit clearer vision, but sometimes the opposite will obtain. For instance, a hypermetropic (long-sighted) child suffering from accommodative squint often finds that objects seen through the appropriate convex lenses appear less well defined than they did with the uncorrected vision, until enough time has elapsed for adaptation to the new spectacles. Thirdly, spectacles may be used as a means of protection against uncomfortable or dangerous influences. Anti-glare glasses for use in bright sunshine are increasingly demanded. Other types of spectacles have been devised as a shield from infra-red rays or noxious vapours in certain industrial processes, as well as from flying particles and other occupational hazards.

Refraction not a Closed Compartment of Knowledge

Although retinoscopy, which is the main objective means of estimating refractive error, could be learned in a few weeks by the exercise of intelligent application, many processes besides retinoscopy are needed before a correct decision can be reached with regard to spectacles. Questions of age, aptitude, and occupation must be considered, and the interpretation of subjective tests is not always easy. Then again, refractive errors are often associated with, and may even arise from, certain constitutional diseases—for example, diabetes. A technically competent retinoscopist ignorant of ophthalmoscopic signs will inevitably order

glasses for patients incapable of benefiting thereby. Let us therefore agree that *no spectacles (other than mere protective appliances) should be prescribed until the ocular fundi and media have been thoroughly surveyed*. We have already seen that there are many other relevant considerations besides the actual state of the eyes, but at least that state must be determined before entertaining the possibility of spectacles. It will now be convenient arbitrarily to divide patients into three categories: (1) those up to the age of 14 years; (2) those from 14 to 40 years; and (3) those over 40.

Patients under 14 Years

Children with a large amount of refractive error, especially if they are myopic, will require spectacles to enable them to see clearly; and, although failure to supply the necessary glasses will not directly damage such children's eyes, it must be remembered that other serious disadvantages are entailed. To live in a world where every inanimate object looks misty, and every human face is a featureless blur, must grievously retard the growth of knowledge and will in many cases produce clumsiness and lack of confidence. The presence of a large refractive error will often remain undetected until a child begins to walk about, and perhaps until he begins to look at picture-books or goes to school. At this point it will be relevant to pose the question: *How early in life are glasses feasible?* From time to time one sees 1-year-old infants wearing spectacles, and occasionally these appliances are given to babies within a year of birth, but I believe that none should be prescribed for patients under 2 years old. Admittedly cases arise in which there are arguments in favour of spectacles for children under 2, but such arguments are outweighed by the obvious difficulties and disadvantages of wearing glasses so early in life.

Spectacles in children are often an essential item in the treatment of squint, and especially in the accommodative variety of convergent squint associated with hypermetropia. Astigmatism is often combined with hypermetropia in such cases, and many will exhibit a different level of refractive abnormality in the two eyes. *How often should children for whom glasses are necessary be retested?* It is a good thing to arrange that re-examination should be performed once a year, but there will be many children who will need to be reinvestigated at shorter intervals. When spectacles are being used as a major item in the treatment of squint and other forms of ocular muscle imbalance, their strength may from time to time require modification, even if there has meanwhile been no change in the basic refraction.

Should children wear their glasses constantly? Yes, if the unaided visual acuity is very defective. Another reason for constant wear is the presence of accommodative squint. In such cases it may later be possible to relax the rule, reserving the glasses for close work only. Children suffering from slight myopia may be able to get on comfortably without spectacles for most out-of-school activities, and wear them for seeing the blackboard, looking at films, etc. All prescriptions should clearly indicate whether or not the spectacles should be worn constantly.

Light metal frames are as a rule most suitable for children, and in the early years frames will best be supported by the sides of the nose. For 2-year-old children the ear-pieces usually have to be joined with a tape tied at the back of

the head. Unsplinterable lenses are advisable up to the age of about 8 years, and of course for older children as well when the spectacles are going to be used for cricket.

Patients of 14 to 40 Years

Adolescents with rapidly advancing myopia may for a few years need an annual test, but this interval can be considerably lengthened in the great majority of patients aged 14 to 40 years. It is quite wrong to assume, as many people do, that spectacles need to be changed at fixed intervals. Some people's refraction remains remarkably consistent for ten, fifteen, or even twenty years. Those who display greater variation do not necessarily change at a constant rate. In the course of a given year they may alter more than twice as much as they do during the preceding or succeeding period of three years. Adolescents should perhaps be re-examined biennially, but adults can usually go for longer than two years if their eyes are otherwise healthy, and if they have not recently been exhibiting rapid change. Five years may usually be allowed to elapse before such grown-up people come for another test. If there should be a considerable change before that time, the patient will probably notice new visual symptoms, and thus be prompted to seek earlier examination.

The role of spectacles in the treatment of muscle imbalance is relatively small among adolescents and adults. Therefore few of them will choose to wear glasses constantly unless their visual acuity is thereby sharpened. Young people with only moderate hypermetropia usually prefer to reserve spectacles for close work, because their accommodational reserve still enables them to see far objects clearly. As they approach the age of 40 they will become increasingly dependent upon spectacles for clear definition at all distances.

What are the chief symptoms which suggest that spectacles may be required? The cardinal symptom is blurred vision, which will be experienced by all those suffering from gross refractive errors. Myopia even in small degrees interferes greatly with the detailed appreciation of distant objects. Small amounts of hypermetropia may incite no symptoms in children and young adults. Indeed moderate hypermetropia is physiological in the early years of life, and requires no treatment unless it is associated with a disorder of ocular muscle balance. Another important symptom is proneness to ocular fatigue. Thus, for instance, a patient suffering from hypermetropia, especially if it were linked with astigmatism, might find that words on a page tended to run into each other, and that the act of reading became uncomfortable after a few minutes.

Headache is undoubtedly a possible symptom, but it must be emphasized that most headaches are not due to refractive errors. Patients are often sent for superfluous eye examinations "to exclude refractive error as a cause of their headache." When abnormality of refraction does substantially contribute to headache, it will often be found in association with ocular muscle imbalance, and the patient usually complains that his headache is provoked by long spells of close work. Headache unrelated to concentration of gaze is unlikely to be of ocular origin, and in many instances the history will supply a clue. Thus, for example, headache arising from congestion of the accessory sinuses may exhibit a regular time-cycle, or may show characteristic aggravation from temperature changes. Incidentally it is worth remembering that considerable refractive errors often come to light during the routine testing of people who have never complained of headache.

Patients over 40 Years

Those who are free from hypermetropia, myopia, and astigmatism will retain their distant visual acuity in middle life, assuming that their eyes are otherwise normal; but few of them on reaching the age of 50 can still thread a needle unaided or read small print by artificial light. Indeed, many of them require convex glasses for near work while they are in their forties. Some put off the day of yielding to

spectacles, lest they become too dependent upon these artificial aids. They should be told that they are engaged in a losing battle, because in fact the reserve of accommodation (focusing power) dwindles from childhood onwards. If it were a question of the ciliary muscle waning in strength, the need for reading glasses might well be postponed by dint of extra effort. The main reason, however, for accommodational failure is progressive rigidity of the human lens, which grows like an onion by successive superimposed layers, so that contraction of the focusing muscle no longer produces the alteration in curvature requisite for close work.

If their eyes are in other respects normal, presbyopes do not need to be tested every year. Until they reach the age of 60—by which time their accommodation is almost entirely gone—there is an increase in the relative convexity of their spectacles is likely to be needed at intervals of two to five years, but wide variations occur between different patients, and even the same patient will often vary the speed of his refractive change at different epochs. Important alterations in refraction after the age of 60 are as a rule associated with changed relationship between the density of the nucleus (core) and cortex (outer layers) of the lens.

At the age of about 45, habitual wearers of spectacles find that their distance correction is no longer suitable for reading. Some of them will see small print better without their glasses. Let us imagine, for instance, a patient aged 55, with 2.5 dioptries of myopia. He will be able to see the 6/6 line of distant test-types with the aid of his glasses. If he had been free from distant refractive error, he would probably by this age have needed a pair of +2.5 spheres for near work, but this correction is exactly counteracted by his 2.5 dioptries of myopia. Therefore he will not need special reading glasses. He simply takes off his spectacles whenever he wants to scrutinize near objects.

With the exception of that minority of myopes who can manage without reading glasses, presbyopic patients suffering from other refractive trouble cannot use their eyes efficiently for all purposes unless they obtain either bifocals or else more than one pair of glasses. One often meets people reluctant to face that alternative. When the advantages of bifocals are explained to them, they are apt to expatiate on the failure of a friend to become adapted to this device. On the other hand, they resent the inconvenience of using two different pairs of spectacles. Sooner or later they must decide which of the two plans will suit them better, because one fact is inescapable: no single strength of glass will enable them to achieve their best visual acuity both for near and distant objects when once they have entered the presbyopic stage.

Patients over 60 seldom take happily to bifocals, because (a) they are less swiftly adaptable to a new form of appliance, and (b) the difference between their distance and near correction is well-nigh maximal, so that they are more likely to feel confusion when they look down through the lower—for example, the reading—part of the glass on stepping off a kerb or descending a staircase. This last disadvantage can be prevented by arranging for a continuation of the distance correction below the reading portion of the glass, but even so it is often too late for the patient to get accustomed to bifocals. Therefore it is advisable to begin bifocals at or before the age of 50, if the patient requires a distance as well as a near correction. Even if the distant vision is normal, bifocals are worth considering. Plane glass can be supplied for the upper part of the spectacles, and then a presbyope need not keep pulling off his glasses every time he wants to look up from his notes. Nor need he sit with his reading glasses sliding half-day down his nose. Bifocals are particularly valuable to presbyopic artists, medical men, barristers, and administrators occupied with interviews. Such people have need of a device enabling them rapidly to alternate between the scrutiny of far and near objects.

Trifocals are another useful type of spectacles for certain occupations. Between the near and distant correction is an area occupied by a lens of intermediate strength, whereby

a clear view can be obtained of objects about one metre away—for example, a music score. A certain amount of intelligent concentration is needed before the patient can fully appreciate bifocals, and naturally this generalization applies with even greater force to trifocals. Moreover, it goes without saying that accurate frame measurements and skilled fitting by the optician are especially important when spectacles incorporate more than one kind of correcting lenses. Numerous other special devices are available for people engaged in exacting tasks—for example, philately, watch-repairing, or the inspection of electric-bulb filaments.

Fallacies and Misconceptions about Spectacles

So many disquieting myths are apt to circulate concerning the visual function, not only among the lay public, but sometimes within our own profession, that it may be worth while to end with a few denials:

It is almost impossible to damage the eyes by long hours of reading and sewing, even if great fatigue is experienced at the time.

Spectacles worn by mothers and nursemaids do *not* make children squint.

Migraine is *not* due to refractive errors, and cannot be cured by the provision of spectacles.

Most headaches are not due to eye trouble.

Myopia *cannot* be cured by orthoptic exercises, or by electrical treatment, or indeed by any known method of therapy.

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BLOOD TRANSFUSION ACCIDENTS

The following statement on blood transfusion accidents is published at the request of the Consulting Pathologists Group Committee.

The war that spurred the development and perfection of radar, turbojets, and penicillin, and thus helped us have television, Comet travel, and potent antibiotics, left us with well-organized blood-donor panels whose continuing vital gifts, no longer required for wounded, are used for the needs of the sick. Blood is now provided for all medical, obstetrical, and surgical emergencies, and most hospitals have a blood bank or obtain blood from the bank of a near-by hospital within the group; these banks are supplied by the National Blood Transfusion Service. More recently the British Red Cross Society has stated that donors on its panels are available for giving fresh blood of all groups, at all hours, for planned or emergency work.

Benefits of Blood Transfusion

In addition to the immediate saving of life, blood transfusion, like improved anaesthesia, has made major thoracic surgery more easily possible and other major surgical procedures more safe. Again, apart from the operation period, those anaemic from chronic blood loss are now prepared for a necessary operation in shorter time; while, in the newborn, erythroblastosis is fairly regularly treated by replacement transfusion. Thus we have reached a point when we can say that the benefits of blood transfusion are as great in peace as in war.

The great boon that blood transfusion is may not be fully appreciated by the public: those who have benefited and

their relatives know, and that most generous and unselfish group, the donors who perform a great public service, they know; but to the general public a blood-donor session and the giving of blood in hospital are things remote. It is thus the more regrettable that a large newspaper-reading population should be introduced to the subject of blood transfusion by headlines that high-light almost every fatality. The incidence of such fatal cases is thus grossly exaggerated and needless alarm thus spread. The true incidence of death resulting from accidents in blood transfusion is not known for the whole country, but in one large hospital in the London area it has been of the order of one death in a period of six years, in which 13,000 bottles were transfused.

The Element of Risk

However, it must always be borne in mind that there is a risk attaching to blood transfusion and that every step must be taken to minimize the chance of causing death in the attempt to save life. Thus, since the risk has been stated as similar to that of uncomplicated appendicectomy, similar consideration should be given to, and plans made for, a blood transfusion as would be given to the question of opening an abdomen for appendicectomy. Always there should be regard for the need as evidenced by the haemoglobin level or the known blood loss.

There is an increasing demand for blood which tends more and more to exceed the supply; this suggests that there may be a certain measure of over-prescribing, which adds to the risks undergone by some patients and acts to the detriment of others who are really ill and require a life-saving transfusion. The three points at which a patient about to be transfused is placed at risk are in the *prescribing* of the transfusion, in the *grouping and matching*, and in the *giving*.

The request for blood ought always to be directly equated to the need. Thus it appears unjustifiable to place any patient at risk for one pint of blood; such cases would do well with a plasma substitute, because only blood volume can be involved when the loss is so small. In healthy young women with slight loss of blood from abortion, miscarriage, or at term the natural recuperative powers must neither be forgotten nor superseded.

Grouping and Matching

The blood bank at each hospital should be under the care of the hospital pathologist, whose responsibility it is to ensure that (i) the grouping of the patient and the matching of blood are done only by experienced technicians, resident pathologists, and/or resident housemen who have been trained and are thoroughly experienced in the methods, and (ii) satisfactory arrangements have been made for care of the bank and grouping and matching at night and at week-ends (see circulars R.H.B. 51/89 and H.M.C. 51/82). In this connexion hospital management committees should arrange that technicians, when on call, should be transported or given travelling expenses and paid for this emergency work.

For maximum safety in grouping and matching two things are essential—adequate time in which to do all the tests and the full relevant history of the patient. Most laboratories now have a special request form to be completed when blood is wanted. This form contains space for details of previous transfusions and any reactions to them and also for the obstetric history in so far as it relates to jaundiced babies and stillbirths. This information determines the additional serological tests that may have to be made.

It is not yet generally known that for the actual grouping and matching of blood for transfusion to be done thoroughly up to four hours may be required. The tests are no longer made on slides or tiles and in three to five minutes. The increasing frequency of transfusion of patients makes more than ever necessary full time for the interaction of cells and sera in ABO- and Rhesus-grouping and in compatibility testing. Thus two hours is the time of incubation (in tubes,