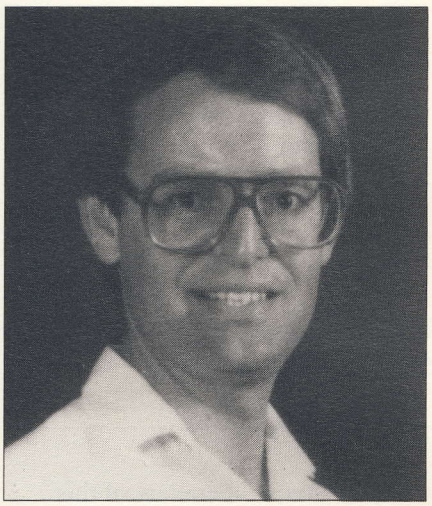
# Thyroid Gland Disorders – Dr R Moore



Dr R Moore
MRCS Eng, LRCP Lond, MRCP (UK)
5 Berkeley Crescent
Durban North
4051

## Curriculum vitae

Dr Moore qualified at St Mary's Medical School, University of London in 1971 and spent most of his postgraduate studies at Addenbrookes Hospital, Cambridge, where he took up a special interest in endocrinology. Research interest and publications have mainly revolved around changes in the thyroid hormones and their cellular receptors in obesity and anorexia nervosa. He immigrated to the Republic of South Africa in 1981 when he took up a post of senior lecturer in the Department of Medicine, King Edward VIII Hospital in Durban. Since 1983 he has been in private practice as a Specialist Physician with a special interest in endocrinology, diabetes and resistant obesity.

*Summary*

*Most laboratories now perform thyroid function tests in the form of free T3, free T4 and TSH levels, these measurements not being influenced by changes in the thyroid binding proteins, mainly TBG and albumin. Most cases of hyperthyroidism are due to the Graves Disease and the treatment of choice for all patients over the age of 18 is radio-iodine. Far too many operations for hyperthyroidism take place in the private sector in South Africa and the blame for this must rest with the general practitioner who arranges the initial referral to a surgeon rather than a physician. In areas where I131 therapy is not available, an initial one year treatment with carbimazole is indicated, remembering to start with a high dose and reduce when biochemical euthyroidism is achieved. The treatment of choice for hypothyroidism is given. All patients with a previous history of thyroid dysfunction require lifelong follow-up by their GPs at approximately yearly intervals, and the use and abuse of thyroid scans are discussed.*

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## Thyroid Function Tests

Most laboratories throughout the country now report function tests in the form of Free T3, Free T4 and TSH. These "free" hormone levels measure the 1% of circulating hormone that is unbound to plasma proteins - mainly thyroid binding globulin (TBG) and albumin. Thus these "free" levels are not influenced by changes in these protein levels as is found in some hereditary disorders and is unaltered by drugs and hormones such as oestrogen. The free hormone levels may, however, still be altered in the sick enthyroid syndrome characterised by a low FT3, FT4 and TSH. This condition occurs in acutely ill patients and represents an understandable adjustment of the hypothalamic and pituitary feedback mechanism in order to reduce metabolism and thereby conserve energy in such situations. This set of results may also be seen in secondary hypothyroidism due to a pituitary or hypothalamic problem.

## Hyperthyroidism

The majority of cases are due to Graves Disease in young to middle aged females and the associated eye signs in this condition usually make the diagnosis obvious. It must be noted, however, that the clinical appearance of eye signs (which may be unilateral) may come on years before or after the clinical toxicosis state. The single toxic nodule and the multinodular toxic goitre usually occur in the older age groups.

## Graves Disease

After confirming the clinical impression biochemically, the doctor should ideally give the patient the choice of 3 possible forms of treatment:

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a) *Carbimazole* in an initial dose of 10mg 8 hourly, dropping the dose down gradually to a maintenance dose of between 2,5mg BD and 5mg BD once biochemical control has been achieved. This may be combined with propranolol during the first few weeks in order to achieve a more rapid clinical improvement. An alternative to

### Most cases are due to Graves Disease

the above classical treatment schedule with carbimazole is to keep the patient on a maintenance dose of 5mg 8 hourly and when FT4 levels have fallen to the low normal range, adding Eltroxin 0,1mg and keeping up with this combination for 1 year. This semi-total blockage and add-back T4 scheme means less frequent biochemical monitoring is required during the year since it is a more stable form of therapy.

Carbimazole should be used for a maximum period of 1 year and the treatment should then be withdrawn and an FT4 level performed 6 weeks later. 50% of patients will have undergone spontaneous remission during this year's treatment. On the other hand, the other 50% will have an early relapse. If this occurs, the patient and doctor together then have the choice of 3 alternative treatments once again. In the event of the allergic reaction to carbimazole, propyl-thiouracil may be used instead.

b) *Surgery* - in the opinion of all endocrinologists and enlightened general physicians, the only indications for surgery in thyroid disease in general are as follows:

i) where malignancy is suspected

ii) where the goitre is very large and cosmetically unacceptable

iii) where there are symptoms of tracheal or oesophageal compression

iv) where allergy to antithyroid drugs is encountered and fear of radiation therapy exists.

It is obvious from the above comments that far too many thyroidectomies are performed, particularly in the private sector in South Africa and the blame for this rests with the general practitioner who refers the average Graves Disease patient to the surgeon in the first place.

c) *Radio-iodine* - this treatment has become the therapy of choice because of its simplicity, it is painless and it is relatively inexpensive (approximately R150,00 for an average dose). No hospital inpatient stay is required,

### After biochemical confirmation, a choice of 3 possible forms of treatment

it is not used in patients below 18 years of age (although it has been used in children in the USA for the past 40 years) and it is contraindicated in pregnancy and when breastfeeding.

An enormous experience has been built up in the USA on this form of treatment and 40 year followups are not uncommon. The previously more conservative British (and RSA) approach to I131 therapy because of the theoretical hazards has now given

### Far too many thyroidectomies in the RSA

way to a more liberal use of this therapeutic method:

i) ? induction of hypothyroidism - 10 to 30% after 1 year and a steady 3% per year thereafter. This compares with a hypothyroid rate of between 3 and 40% 2 years after surgery;

ii) ? thyroid carcinogenic action - no evidence of an increased risk in adults over 18 years;

iii) ? leukaemia/lymphoma - no increased incidence in one series of 36 000 people;

iv) ? gonadal damage - no increase in the number or type of congenital defects in the offspring of either parent who have received I131.

Radio-iodine takes 8 to 12 weeks to start having an appreciable effect on the T4 output from the gland and neomercazole should be used to cover this period.

In summary, in the treatment of hyperthyroidism, the doctor must be fully aware of the pros and cons of each form of treatment and be able to offer impartial advice to his patient. Because of this, all patients should be

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referred to a physician in the first instance and if there is one in the locality with a special interest in endocrinology, all the better. Where access to a physician is not possible, it is preferable to treat the patient medically for the first year rather than refer the patient to a surgeon who is not well experienced with the special skills of thyroid surgery and its attendant complications.

### Hypothyroidism

As with hyperthyroidism, the clinical signs and symptoms of this condition are well known and will not be mentioned here save to say that mild forms of the condition may easily go undetected for many years and untreated, these patients run an excessive risk of hypercholesterolaemia and coronary heart disease.

In biochemically borderline cases, the TRH stimulation test is a useful confirmatory test, showing an exaggerated TSH response to its releasing hormone.

The treatment of choice for this condition is Eltroxin, remembering always to start with a low dose of 0,05 or 0,025mg daily in the elderly and those with coronary heart disease. The average replacement dose is 0,15mg daily as judged by the suppression of the TSH but many patients in general practice are on a much higher dose than this. The syndrome of resistance to thyroid hormones is a definite entity but exceedingly rare. Monitoring should initially be done at 6 weekly intervals until the TSH is less than 5mU/ℓ and subsequently at yearly intervals to keep the FT4 level between 20 and 30pmol/ℓ. Where persistent excessive weight is present Tertroxin (40 to 60 micrograms per day) may be more effective in promoting weight loss. Lifelong followup is required for all patients with a history of hypothyroidism to check on the possibility of recurrence in spite of previous definite treatment and the more common occurrence of late hypothyroidism. Remember, any patient with hypo- or hyperthyroidism carries a 60-fold increased incidence of pernicious anaemia and a 100-fold increased incidence of cranial arteritis. This followup can easily be performed by the general practitioner.

### Thyroid Nodules

Solitary thyroid nodules should initially be investigated with thyroid function tests and a thyroid scan. If function tests are in the hyperthyroid range and the nodule is "hot", I131 therapy is the treatment of choice. If the function tests are normal and the scan depicts a "cold" nodule, referral to a surgeon is indicated for a needle biopsy or surgical removal of the nodule which carries a higher risk of malignancy in this situation. If access to a thyroid scanner is not available, immediate referral to a surgeon would be indicated.

### Radio-isotope Thyroid Scans

These are obsolete in the diagnosis of hyper- or hypothyroidism but are useful in the differential diagnosis of these conditions:

a) Uptake Scans (%):

Hyperthyroidism - increased in:

Graves Disease
Toxic multinodular goitre.
TSH mediated toxicosis (very rare).

Hyperthyroidism decreased in:

Iatrogenic and (factitious)
Thyroiditis.
Ectopic thyroid tissue.

b) I125 or Technetium scans -

characterisation of thyroid nodules, hot or cold.

identification of ectopic thyroid tissue.

evaluation of neck and mediastinal masses of uncertain origin.

the detection of metastases from well differentiated thyroid carcinomas.

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