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## The Hand in Clinical Medicine

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### Abstract

It is no wonder that the diagnostic value of the facies has often been emphasised, for expression, form, colour, condition of the skin and hair and many other features can be studied from the beginning of the interview. In clinical practice it is common, after examination of the face, to take up the hand and feel the pulse. The experienced clinician may gain almost as much information from the hand as from the face, for the hands also show expression and character. Furthermore the hands are so highly developed that the blind and the dumb may use them as effective substitutes for reading and for speech, and many of us gesticulate for emphasis. Indeed, gestures made by patients to indicate the site and character of symptoms can be most helpful. Thus the flat of the hand is pressed upon the vertex of the head with psychogenic headache, both hands squeezing across the front of the chest commonly indicates ischaemic heart pain, or the tips of two or three fingers pressed into the epigastrium suggest the pain of peptic ulcer.

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# THE HAND IN CLINICAL MEDICINE

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It is no wonder that the diagnostic value of the facies has often been emphasised, for expression, form, colour, condition of the skin and hair and many other features can be studied from the beginning of the interview. In clinical practice it is common, after examination of the face, to take up the hand and feel the pulse. The experienced clinician may gain almost as much information from the hand as from the face, for the hands also show expression and character. Furthermore the hands are so highly developed that the blind and the dumb may use them as effective substitutes for reading and for speech, and many of us gesticulate for emphasis. Indeed, gestures made by patients to indicate the site and character of symptoms can be most helpful. Thus the flat of the hand is pressed upon the vertex of the head with psychogenic headache, both hands squeezing across the front of the chest commonly indicates ischaemic heart pain, or the tips of two or three fingers pressed into the epigastrium suggest the pain of peptic ulcer.

A study of all the conditions in which examination of the hand may contribute substantially to diagnosis would result in a long, dull catalogue. It is proposed therefore first to consider variations in form and function and then to give a sufficient number of illustrations to indicate the diversity of the specialties which may be concerned.

## GENERAL OBSERVATIONS

The firm determined grip or the soft flabby handshake so often reflect the personality. The manicured or the careworn hand, the tobacco stains, the bitten nails, the nervous tremor, the the ring on the finger and the foreign tattoo each tell their story. The circular tattoo in the first left interdigital space made by pen and ink at school can be distinguished from injuries contaminated by coal dust. This may well provide an essential clue to the cause of breathlessness in a patient, previously a miner, who has not divulged that he has changed his job. Conversely the occupation may indicate the cause of many hand lesions such as the pilonidal sinus of barbers, erysipeloid of butchers or anthrax of tanners. A transverse ridge at the same level on each of the nails may date a forgotten illness by the fact that the nails take about six months to grow.

## Movements

In addition to gesticulation and the nervous tremor already mentioned, there may be a familial tremor so easily and unkindly mistaken for the shaky hand of the chronic alcoholic. The hyperkinetic hand of the thyrotoxic patient plucks and twines a handkerchief or nearly tears off the buttons in haste to undo the vest. The flapping, darting movements of the outstretched hand are characteristic of renal or

hepatic or respiratory failure and may be bad enough to cause articles to be flung to the ground. The jerky movement of rheumatic chorea may be exaggerated by picking up an object, while the rhythmic pill rolling of paralysis agitans will cease during a purposeful movement. The finger-nose test and dysidiadochokinesis are among the standard tests for demonstrating sensory and cerebellar ataxias, made worse in the former by closing the eyes.



Figure 1

#### Size and Shape

A disproportionately broad hand and fingers may be helpful confirmation of acromegaly. The long thin fingers (arachnodactyly) of Marfan's syndrome (Fig. 1) could be useful corroboratory evidence of dissection of the aorta in a young person. A great variety of other inherited disorders such as polydactyly, a bent little finger, or a stumpy, broad-nailed, terminal phalanx of the thumb are useful genetic markers. Symphalangism is rare but evidently persistent as shown by the famous Talbot family whose illustrious ancestor from the 14th century is alleged to have shown fusion of the phalanges when the skeleton was disinterred in Salisbury Cathedral. It is a pity that this story has recently been doubted and the family tree pruned by a few hundred years.

#### Colour

Pallor of the hands, especially of the nails and the palms, is a useful clinical check for anaemia. Cyanosis indicates an unusual degree of oxygen desaturation of the blood. Only if

the hand is warm in a temperate climate can it be deduced that the cyanosis is central in origin. Even then there is the rare exception of polycythaemia rubra in which it is the density of colour that gives the cyanotic appearance. It is well to remember in assessing colour that any dark pigment deep to the skin looks blue due to the rearrangement of light as it passes through a turbid medium. The light which is transmitted contains a greater proportion of the longer wavelengths (red), while that which is scattered to the sides and back to the surface contains a correspondingly large proportion of shorter wavelength (blue). For example, the dark blue of a tattoo is made by lampblack (Indian ink) while the blue colour of the veins is due to the dark red blood within them. If the skin of the back of the hand becomes very thin in the elderly or in sufferers from rheumatoid arthritis then the veins may be red. Brown pigmentation due to an abnormal amount of melanin is a feature of a number of local and systemic disorders; it is characteristically seen, especially over the knuckles and in the palmar creases, in many cases of Addison's disease.

#### Temperature

The examiner's hand is a superb thermometer and it is usually easy to observe by palpation that a patient is febrile. In a temperate climate the temperature of the patient's hand is a good guide to the mean blood flow through it, and in appropriate circumstances it may be a helpful indication of peripheral blood flow in general. Hot moist palms often indicate hyperthyroidism, while cold and clammy ones may be due to nervousness. It is a remarkable fact, not always appreciated, that thermal sweating does not affect the palms.



Figure 2



Figure 3

#### Structure of the Hand

Any of the structures of the hand may be affected by a variety of local and systemic disorders, all of which must be recognised in order that the importance of each may be assessed. Sex and age changes may occur. Thus the smooth hairless hands of the child should change to a more lined and hairy hand in the adult male unless hypogonadism is present. In the elderly an atrophy of the collagenous supporting tissue leads to wrinkling, to a characteristic type of purpura and a mottled brown and white pigmentation. The nails, joints, bones, muscles, tendons, nerves, and arteries may be affected by systemic disorder and as examples of each are koilonychia (due to iron deficiency), gout, sarcoidosis, motor neurone disease, xanthomatosis, leprosy and disorders of the pulse.

#### THE DIFFERENT SPECIALITIES

It is not too fanciful to suggest that in cardiology a diagnosis of subacute bacterial endocarditis could be made from the hand alone. No doubt a well taken clinical history should be leading in the right direction, but a pale hand, a waterhammer pulse, clubbing of

the fingers, with several splinter haemorrhages beneath the nails and small tender lumps on the palmar aspect of the fingers (Osler's nodes) would provide the full house.

Reference has already been made to acromegaly, hypogonadism and hyperthyroidism and there are other endocrine changes such as hypopituitarism, myxoedema, tetany and hyperparathyroidism. Before the days of P.B.I. estimations and radioiodine studies some surgeons judged the severity of thyrotoxicosis with greater confidence by shaking hands with the patient than by accepting a figure derived from a dubiously performed B.M.R. estimation. The tachycardia, the bounding pulse, irregular perhaps due to atrial fibrillation, the hot sweaty palms and the fine tremor are still very useful signs. In hyperparathyroidism, absorption of bone may sometimes be sufficient to shorten the terminal phalanx. The soft tissues are then redundant, the end of the finger becomes bulbous and the nail curved. Spotting this pseudoclubbing of the hand led to the diagnosis in a matter of seconds in the case of a woman who previously had been investigated in three hospitals, without success. (Fig. 2)

The dermatologist could have a field day with the hand alone. The amateur suspecting scabies will find that the hand is helpful in providing lesions between the fingers where the characteristic burrows may be seen as thin sinuous lines, from the active end of which the mites may be obtained.

The forensic expert, in league with the C.I.D., may be able to identify a body or a crime from the fingerprints. Indeed, it was this fact that led Dr. Ruxton to attempt to get away with murder by removing, among other things, the terminal phalanges of his victims.

spleen would be comforting confirmation to the clinician.

The geneticist has good reason to be interested in the hand, for inherited abnormalities are so easily seen. Reference has already been made to some of them, but there are many others such as webbed fingers (Fig 3) or the nail-patella syndrome. The latter is a quaint complex of dystrophic or absent nails, small patellae and bony outgrowths on each ilium, which is transmitted as a dominant syndrome.

Finger nails which are concave on the upper surface, thin and brittle (koilonychia)



Figure 4

Flapping tremor, central cyanosis, finger clubbing, leuconychia, spider telangiectases, erythematous palms and Dupuytren's contracture may alert the gastroenterologist to the cause of haematemesis, for any or all of these signs may be present in conjunction with hepatic cirrhosis. Dilated veins on the abdominal wall, some ascites and a palpable

indicate to the clinician that iron deficiency is present before the haematologist comes to the rescue. The reason for the iron deficiency must then of course be sought, but when koilonychia is present the condition is of long standing and is usually due to dietetic deficiency.

Industrial and occupational medicine is commonly concerned with a great variety of

causes of dermatitis, and in the case of tar workers this may lead on to the formation of an epithelioma. Injuries to the hands are extremely common, especially in miners and sawyers, and there are other local hazards such as chrome ulcers and the occupational diseases mentioned under the general inspection.

The *nephrologist* must at present be satisfied with the pale, brownish, dry hand with uraemic twitching as a minor contribution to diagnosis. However, chronic renal disease, which was considered to be due to tuberosc sclerosis, was first suspected in a woman in her sixties by noting the characteristic periungual fibromata: minor lesions present on the face had not been observed.

The *neurologist* has plenty of observations available including, among others, the spontaneous movements already mentioned, sensory and motor changes, muscle wasting and fasciculation, or the very rare azure blue lunulae of hepato-lenticular degeneration.

The *obstetrician* may be consulted about sterility and may observe the short metacarpal and receding knuckle of Turner's syndrome (Fig. 4) while the *ophthalmologist* may notice the long spider-like fingers of Marfan's syndrome in association with dislocated lenses. It might seem too far fetched to include *otorhinolaryngology*, but a woman who was first referred to that specialty for deafness, the cause of which was overlooked, had myxoedema with very little to see in the face; her speech and thought seemed unimpaired though she admitted that her singing voice had deterior-

ated for two years. The hands were slightly swollen in appearance, the skin was dry, and paraesthesiae were present in the fingers due to compression of the median nerve in the carpal tunnel. All these symptoms disappeared on treatment with thyroxine.

The *paediatrician* has interests in common with the geneticist, but has pink disease all to himself for it occurs only in babies and young children. The hands and the feet are so strikingly red, cold and later peeling as to be responsible for the name of the disease.

The *psychiatrist* may find interest in nervous tremor, bitten nails, dermatitis artefacta or barbiturate blisters. In *respiratory* disorders the combination of cyanosis and clubbing with multiple telangiectasia on the fingers as well as around the mouth and face may direct attention to an associated pulmonary arteriovenous fistula. The *rheumatologist* and the *orthopaedic surgeon* have common ground in the various forms of arthritis.

The list is long and could be lengthened both with regard to the number of specialists and the variety of lesions in the hand which is of interest to them. However, more than enough has already been written to draw attention to the diagnostic value which may be found in a careful examination of the hand. It is a part which deserves special consideration for among the major evolutionary features, it is one that has enabled man to control his environment and to rise above all other living creatures.

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## Mesmerism

"The first night I attended to witness a Frenchman, Mr. Lafontaine, perform magnetic experiments; as it was quite possible that the whole of the phenomena exhibited by his patients might have been the result of collusion or illusion, I set the whole down as such. A week thereafter I had another opportunity of watching his performance, when I saw an effect produced upon a stranger, which I believed to be a genuine phenomenon — viz. the inability of the patient to open his eyelids after they had closed. I could not then comprehend the cause of this. Next night I watched very closely whilst he mesmerised this same patient, and before the end of the experiment, I thought that I had discovered the cause of this curious phenomenon."

This paragraph is taken from the opening section of James Braid's "Essay on Hypnotic and Mesmeric Phenomena", a manuscript copy written by the author and presented to the Society in 1853. Braid became renowned in this field and the original article was "read and discussed by them (the members) during three nights of session, 1853."