Colours in Medicine

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One of our most amazing senses, sight, allows us - through the photobiochemical miracle of rods and cones - to see shapes, lines, contrasts, and colours. As an amateur photographer and painter, I have enjoyed trying to understand life's wonders from a pictorial perspective. As a physician, I am weakened if I cannot see my patients.

I look forward to noting the subtle tremor, the high stepping gait, the rhinophyma, and the petechial rash in my medical record. But COLOURS get me interested as much as anything.

Some are pretty common - the pallor of the post-op hip, the rubor of the chronic alcoholic, and the cyanotic lips of advanced emphysema. But less so the sap-yellow green of the late-stage Primary Biliary Cirrhosis, or the sunburn red of erythroderma.

My mum would use the term 'high colour', meaning healthy rosy cheeks of an outdoor lifestyle. Some of those might have had the malar flush of mitral stenosis, polycythemia, or rosacea. The cherry pink of carbon monoxide poisoning, something I’ve never seen, is said to be almost pathognomonic of this sad exit strategy. Bright red is, of course, our colour of warning and danger, conferred to blood by the heme moiety in every erythrocyte. Cherry red spots are innocuous (and yet immortalized Campbell de Morgan*) - unless they appear on the tongue of an anemic patient with hereditary hemorrhagic telangiectasia.

I have seen the blue line of lead poisoning formed when lead salts are visible on the gingival margins. A worker from a battery factory in Winnipeg, back in the day, came in one day with profound anemia and unexplained motor neuropathy. But blue is not a common hue, except in the normal iris, where one can see slate blue, ultramarine, and everything in between. I remember the handsome young man with intense blue eyes (maybe contacts), full of tears. He had just learned of his HIV infection, and in those days, it was a death sentence. They say silver toxicity (prolonged ingestion causing argyria) leads to a grey-blue skin discolouration - seen mostly in the days when colloidal silver solution was thought to have antimicrobial benefits (see the late Paul Karason, “Papa Smurf”).

Purple, on the other hand, is more common. Amiodarone facies, and the heliotrope rash around the eyes and fingers – seen with dermatomyositis – have both come my way. Or simply bruising.

Yellow is a more subtle hue. A faint lemon yellow-tint of the iris may lead you to suspect B12 deficiency in the Crohn's patient with peripheral sensory neuropathy. Any hemolytic anemia, just about, will cause jaundice. The butter-yellow discoloration of xanthelasma is often hidden behind tinted glasses. The pumpkin orange of severe hepatitis usually belies a host of metabolic disruptions (this was a colour anomaly my patient failed to comment upon during our telemedicine consultation. Instead, we discussed his high INR!). A yellow tan begets green only through prolonged obstruction (i.e., biliverdin), and PBC is a good example.

* Campbell Greig De Morgan (22 November 1811 – 12 April 1876) was a British surgeon, forensic pathologist and professor of anatomy (Middlesex Hospital, London). He was first to propose that cancer spread locally, then to lymph nodes and beyond.
I’ve seen pinks (embarrassment), browns (tans), blacks (melanoma, gangrene), and pale orange (carotenemia). Of course, hair and nails can be any colour these days, but mostly through individual preference rather than natural selection.

Pills and potions are frequently identified by colour (red and black capsules - amoxicillin, orange, and black - cloxacillin), but some have drugs themselves have vibrant hues. They say antidepressant pills are often yellow, anxiolytics green, and analgesics white. Blue pills make the best sedatives. When I was an intern, I remember mixing daunorubicin chemotherapy (for my AML patients) – bright red infusions for central line use only. I did not know it came from a strep species isolated from soil near a 13th-century Italian castle: dauni acknowledges the pre-Roman tribe of the region, and rubis relates to its ruby colour.

Other colours might (like various poison-dart frogs) portend a toxic future. Caesium (light blue), and thallium (syboes green) are radioactive poisons that can be sequestrated in the gut by oral Prussian Blue. Intravenous methylene blue can be infused slowly for bad cases of methemoglobinemia, such as one sees in those who have survived a house fire.

Finally, mention should be made of the more common laboratory stains, H&E (hematoxylin and eosin - purple and pink): and ZN (acid fast red tubercles on a pale blue tissue background).

Red-green and full colour blindness must be an awful loss. Colour is as much a part of life as it is of disease and its treatment. And yet visible light is just a small part of the electromagnetic spectrum. What’s your favourite wavelength story?
Carotenemia: Image courtesy https://healthjade.net/carotenemia/ Fair use

Additional Reading

https://visual.ly/community/Infographics/health/link-between-colour-and-medicine
https://www.illumeably.com/article/blue-man-story/