



YDF

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SK+F



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Dear Doctor,

Welcome to the publication of Young Doctors' Forum, April Issue 2023. As always, we have ensured educational noteworthy topics as well as intriguing articles of the medical world.

This issue includes mostly academic topics along with their interpretation and procedure to overcome those cases. We assure you with our best belief that you will find this publication enjoyable and time worthy.

Keep well & stay safe. We wish you a prosperous journey ahead.

Happy reading.....

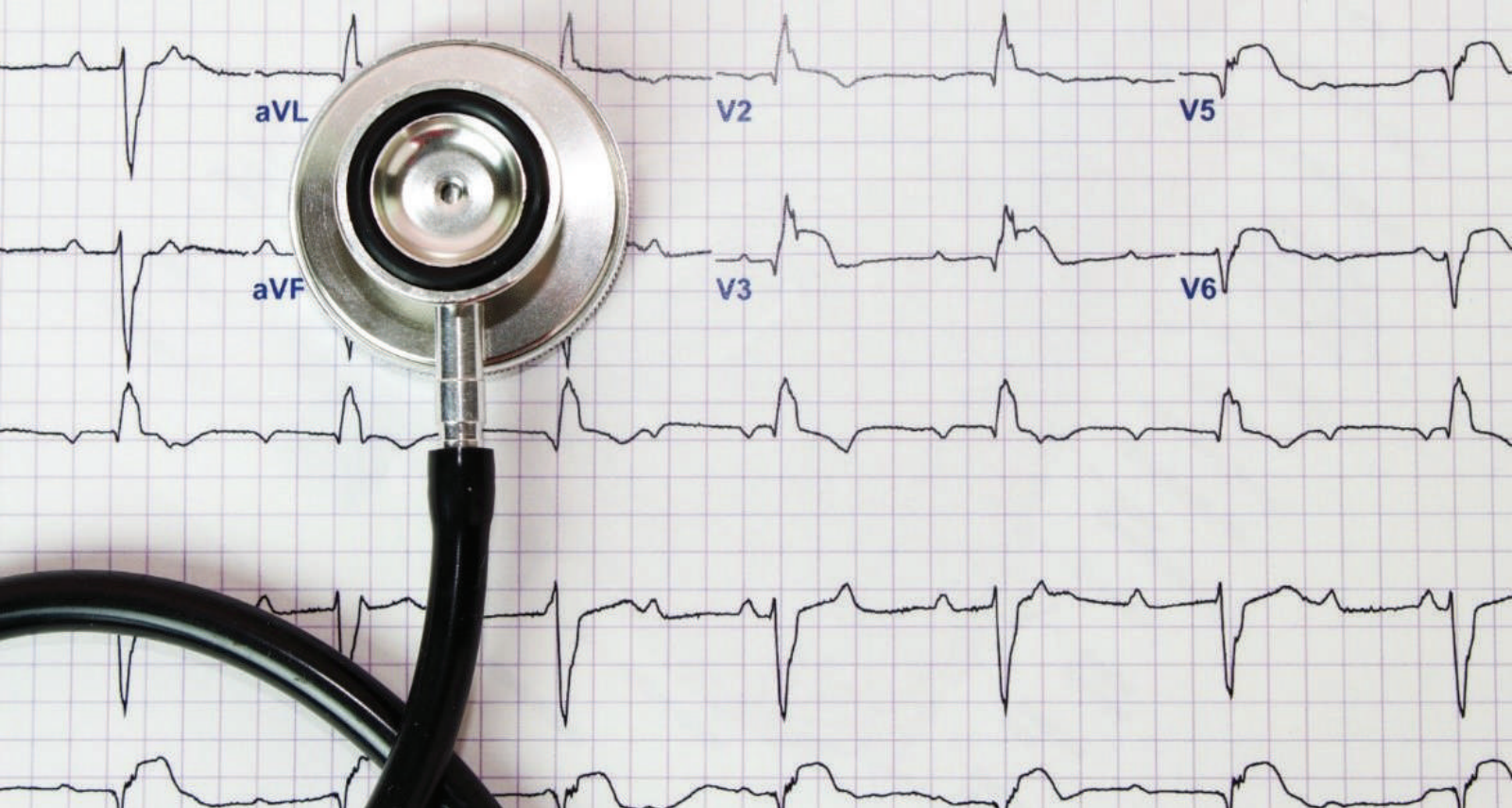
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ECG Wave

Interpretation

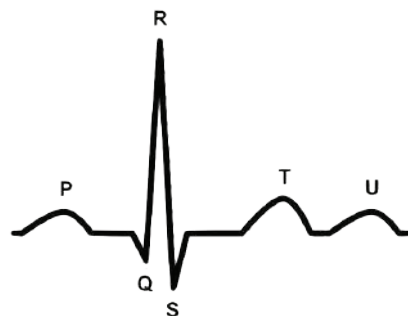
Now if we go back to the ECG tracing, each wave and dip represents a piece of the heart. To better distinguish specific waves and dips in the ECG strip, we assign each wave and dip a letter.

We decipher basic observations by reading the following components of the ECG strip:

- The P wave: This represents a contraction of the atria. This is referred to as depolarization or the squeezing effect. This electrical wave represents blood being pumped out of the atria and into the ventricles.
- The QRS Complex: This represents a contraction of the ventricles. This is the depolarization or squeezing of the ventricles. This entire wave complex represents blood being pumped out of the ventricles and into the rest of the body.

- The T Wave: This represents a relaxation of the ventricles. This is referred to as repolarization or filling of the ventricles. It represents blood filling the ventricles from the atria.
- The U Wave: This wave really has no known reason for being there so we don't have any normal interpretation. However, a prominent U-Wave could indicate a serious cardiac issue.

Obviously in looking at the ECG strip, you can see the QRS complex stands out the most. This is because the ventricles in the heart are much bigger than the atria therefore indicate larger electrical activity.



Now, you may ask, why is there no wave indicating the atria repolarization? Well, you can't see it on an ECG because the QRS complex is such a prominent electrical activity, it literally overtakes the relaxation wave of the Atria.

So now that we are equipped with knowledge of what each part of the ECG wave represents, we can utilize this information to identify arrhythmias.

Common Heart

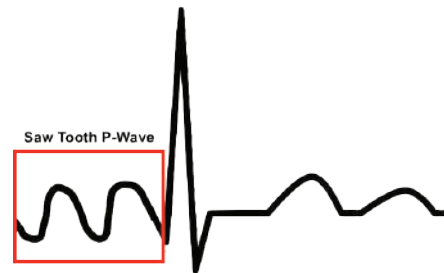
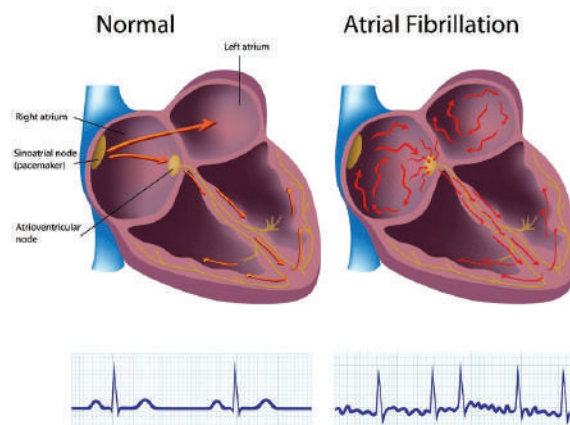
Arrhythmias

Here's what the ECG rhythm looks like:

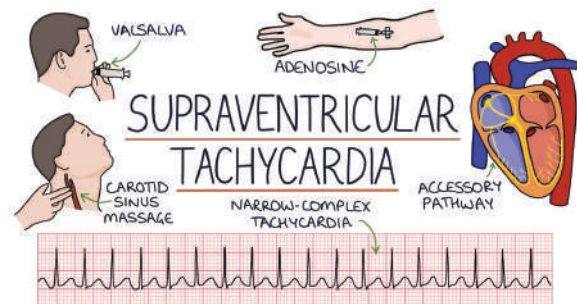
Atrial Fibrillation (A-Fib)

Atrial fibrillation refers to a quiver meaning an inadequate contraction. So whenever, you hear A-Fib – you think Atrial quiver. A-Fib occurs when the SA node is firing rapidly, it's creating an unusually high heart rate for the atria. In basic terms, what's happening is that the heart rate is so fast, the atria doesn't have enough time or thrust to pump all the blood out of the atria and into the ventricles. This causes some blood to stick around in the Atria and continues to circulate around in the atria for each heart beat. This is referred to as stagnant blood and we all know stagnant blood can eventually clot. Now imagine the repercussions of blood clotting in the heart! If a blood clot travels from the atria and makes it way to the ventricles and then on to the lungs or anywhere else in the body, it could cause a pulmonary embolism or even a stroke if it travels to the brain. So this is very important to recognize early to limit blood clots.

The animation below illustrates the atria giving off a faster than normal rate exhibited in A-Fib:

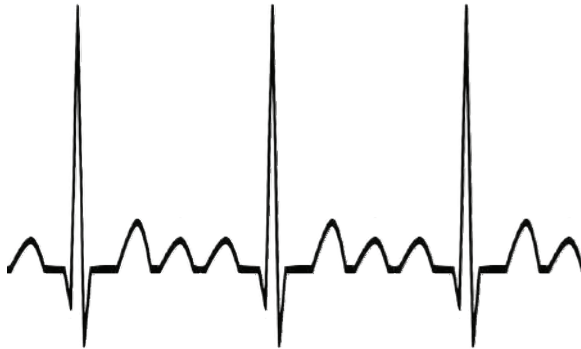


Supra Ventricle Tachycardia (SVT)



SVT is also a very fast rhythm and is originated in the SA node. It's usually exercise-induced and looks very similar to ventricular tachycardia but has an even faster heart beat. You can identify all the normal waves but they are happening so fast, the waves seem to be compacted into each other. The rate is usually around 100-300 BPM and can usually be reversed by performing vagal maneuvers (bearing down or ice packs, blowing through straw, etc). This can help trigger the SA node to kick back into normal rhythm. If not, you will have to move on to various medical therapies.

Here's what a Supra Ventricle Tachycardia ECG rhythm may look like:

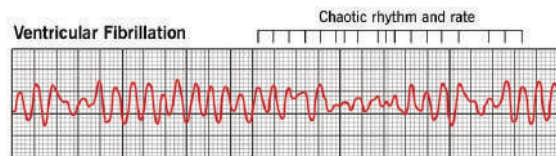
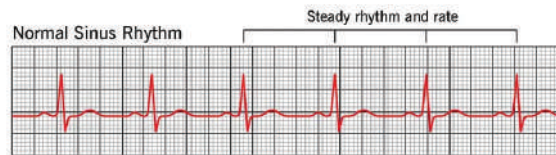


blood is not adequately sent to the rest of the body as it should. This decreased amount of blood perfusion could basically suffocate the body with lack of oxygen delivery.

Since the ventricles are contracting so quickly with no regards to the atrium, you are going to see quivering of the QRS complex. Since the QRS is such a prominent wave, it's going to create an erratic ECG wave that can look something like this:

Ventricular Fibrillation (V-Fib)

V-Fib, just like A-Fib, refers to a quiver or inadequate contraction. However, this time the quivering is occurring in the ventricles. This is a very serious arrhythmia and can be deadly (It's also a shockable rhythm). If the ventricles are quivering then the blood isn't fully emptying and as a result,



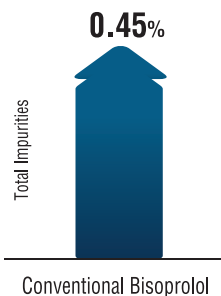
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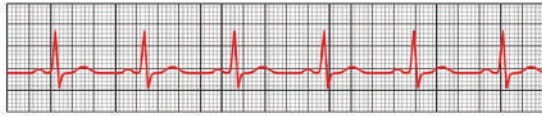


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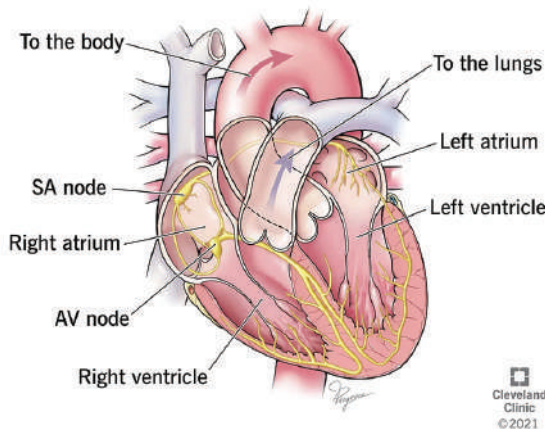
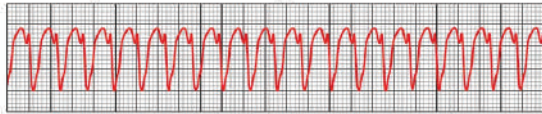
Ventricular Tachycardia (V-Tach)

Monomorphic ventricular tachycardia

Normal ECG

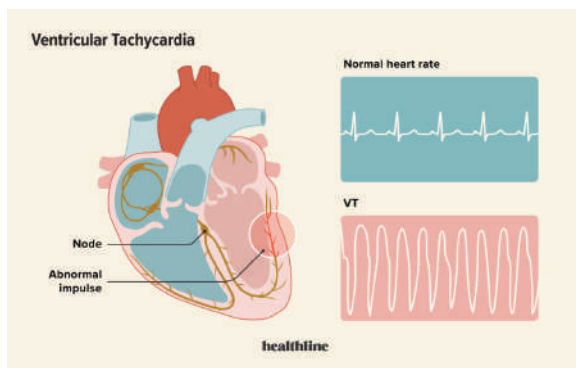


Monomorphic ventricular tachycardia



V-Tach is an abnormally fast rate within the ventricles. The ventricles are contracting too quickly with no regards to the Atria. In this ECG rhythm, you will see a wide QRS complex and very fast rate. The Q-Waves have defined high peaks. It's not as erratic as Ventricular Fibrillation but if not treated soon, can lead to V-Fib.

Here's an animation illustrating V-Tach in the heart:



Conclusion

There are many more types of arrhythmias to study; however, this basic guide should lay the framework for ECG analysis and allow you to have a solid understanding before taking your ACLS or PALS certification courses.

What is the Glasgow Coma Scale?

The Glasgow Coma Scale (GCS), designed in 1974, is a tool that has the ability to communicate the level of consciousness of patients with acute or traumatic brain injury. Developed by Graham Teasdale and Bryan J. Jennett, professors of neurosurgery at the University of Glasgow's Institute of Neurological Sciences, this scale is the gold standard used for all acute medical and trauma patients.

Used by trained medical professionals, the GCS is an objective and reliable tool that nurses and nursing students should become familiar with regardless of their place of employment. Most commonly used in the ICU and ER setting, nurses may need to perform a GCS on a patient at any given time.

The Glasgow Coma Scale, which can identify changes to consciousness in traumatic brain injury patients, is a tool that requires nurses to fully understand its purpose and how to use it. Identifying the patients that require scoring is the first step in properly using the scale.

Glasgow Coma Scale

EYE OPENING	VERBAL RESPONSE	MOTOR RESPONSE
Spontaneous > 4	Orientated > 5	Obey commands > 6
To sound > 3	Confused > 4	Localising > 5
To pressure > 2	Words > 3	Normal flexion > 4
None > 1	Sounds > 2	Abnormal flexion > 3
	None > 1	Extension > 2
		None > 1
GLASGOW COMA SCALE SCORE		
Mild 13-15	Moderate 9-12	Severe 3-8
MEDIC*TESTS #1 EMT & PARAMEDIC EXAM PREP		

When to Use the GCS

The patients who need a GCS assessment have generally suffered a traumatic brain injury and are either in the ER or ICU. An initial GCS should be done at the time of admission and then every four hours unless otherwise indicated by the medical team. Documentation of the GCS is crucial since the medical team, which generally includes neurology, will use this to determine the improvement or decompensation of the patient.

- ▶ Non-testable – Factor interfering with communication (NT)
- ▶ None – No audible response, no interfering factor (+1)
- ▶ Sounds – Only moan/groans (+2)
- ▶ Words – Intelligible single words (+3)
- ▶ Confused – Not orientated but communicates coherently (+4)



How to Calculate a Patient's Glasgow Coma Score

The Glasgow Coma Scale analyzes patients on three different criteria:

- ▶ Eye Opening
- ▶ Motor Response
- ▶ Verbal Response

Each criterion is on a different scale with a total possible score of 15. The lowest possible score is 3.

Eye Response

- ▶ Closed by local factor – (NT)
- ▶ None – No opening at any time, no interfering factor (+1)
- ▶ To Pressure – After fingertip stimulus (+2)
- ▶ To Sound – After spoken request (+3)
- ▶ Spontaneous – Open before stimulus(+4)

Verbal Response

- ▶ Oriented – Correctly gives name, place, and date (+5)

Motor Response

- ▶ Non-testable – Paralyzed or other limiting factor (NT)
- ▶ None – No movement in arms/legs, no interfering factor (+1)
- ▶ Extension – Extends arm at elbow (+2)
- ▶ Abnormal flexion – Bends arm at elbow, features clearly predominantly abnormal (+3)
- ▶ Normal Flexion – Bends arm at elbow rapidly but features not predominantly abnormal (+4)
- ▶ Localising – Brings hand above clavicle to stimulus on head/neck (+5)
- ▶ Obeys Commands – 2-part request (+6)

Medical professionals use the aforementioned scale for the best eye-opening response, the best motor response, and the best verbal response. Consideration is made for those with tracheostomy and endotracheal breathing tubes. The column of 1t is added to verbal response at some hospitals to accommodate those patients without altering their GCS score.

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How to Interpret the Glasgow Coma Scale

To calculate a patient's GCS, first, score the patient on each of the three main areas. Once a number has been determined, add these to create the sum which is the patient's Glasgow score. Once a score has been identified, it's important to understand the meaning.

Every brain injury is different, but generally, brain injury is classified as:

- ▶ Severe: GCS 3–8
- ▶ Moderate: GCS 9–12
- ▶ Mild: GCS 13–15

Certain scores on the Glasgow Coma Scale have significance. Patients with a Glasgow Coma Scale score of 7 or less are considered comatose. Patients with a Glasgow Coma Scale score of 8 or less are considered to have suffered a severe head injury.

As previously mentioned, accommodations are made for intubated patients but also those with gross facial edema, or swelling. These patients are identified with the numerical value of 1 and an attached modifier.

For example, an intubated patient would have a verbal response of 1t, whereas a patient with pronounced eye swelling would have an eye response of 1c identifying the eyes as closed and unable to open due to the swelling.

Limitations of the GCS

While the Glasgow Coma Scale is a great diagnostic tool there are multiple limitations that can alter the score and not provide an accurate picture of the patient's brain injury. These include:

- Pre-existing facts
- Language or cultural difference
- Hearing loss or speech impediment

- Intellectual or baseline neurological deficit
- Baseline psychological issues
- Age (actual and intellectual)
- Current Treatment
- Physical
- Intubation
- Edema (swelling)
- Tracheostomy
- Pharmacological
- Sedation
- Paralysis
- Other injuries/wounds/lesions
- Orbital fracture
- Cranial fracture
- Spinal cord damage
- Dysphasia (language disorder due to damage of the brain)
- Hemiplegia (paralysis of one side of the body)
- External Factors
- Alcohol
- Drugs

A recent study in the June 2017 edition of Neurosurgery magazine entitled "Factors Influencing the Reliability of the Glasgow Coma Scale: A Systematic Review" studies the overall reliability of the GCS in a variety of clinical settings. The review identifies multiple limitations which include the knowledge of the evaluator. The level of education and training of the medical professional can alter the score.

Pediatric Glasgow Coma Scale

Another significant limitation of the Glasgow Coma Scale, as it was originally developed, is that it does not accurately measure traumatic brain injury in children under 5 years of age. The aptly-named 'Pediatric Glasgow Coma Scale (PGCS)' includes modifications for this patient population.

Similar to the adult version, the sum of the eye response, motor response, and verbal response equals the PGCS. The highest score is a 15 (fully awake and aware) and the lowest is 3 (deep coma or brain death).

Eye Response

- Does not open eyes (+1)
- Opens eyes in response to pressure (+2)
- Opens eyes in response to speech (+3)
- Opens eyes spontaneously (+4)

Verbal Response

- No verbal response (+1)
- Inconsolable, agitated (+2)
- Inconsistently inconsolable, moaning (+3)
- Cries but consolable, inappropriate interactions (+4)
- Smiles, orients to sounds, follows objects, interacts (+5)

Motor Response

- No motor response (+1)
- Extension to pain (decerebrate response) (+2)
- Abnormal flexion to pain for an infant (decorticate response) (+3)
- Infant withdraws from pain (+4)
- Infant withdraws from touch (+5)
- Infant moves spontaneously or purposefully (+6)

The GCS and PGCS can be confusing at times but understanding the basics is the first step in mastering the scale. Speaking to advance practice nurses and the rest of the medical team to determine the proper GCS for a patient can help drive the patient's care.

Medi News

This groundbreaking biomaterial heals tissues from the inside out

A new biomaterial that can be injected intravenously, reduces inflammation in tissue and promotes cell and tissue repair. The biomaterial was tested and proven effective in treating tissue damage caused by heart attacks in both rodent and large animal models. Researchers also provided proof of concept in a rodent model that the biomaterial could be beneficial to patients with traumatic brain injury and pulmonary arterial hypertension.

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Artificial intelligence approach may help detect Alzheimer's disease from routine brain imaging tests

Although investigators have made strides in detecting signs of Alzheimer's disease using high-quality brain imaging tests collected as part of research studies, a team at Massachusetts General Hospital (MGH) recently developed an accurate method for detection that relies on routinely collected clinical brain images. The advance could lead to more accurate diagnoses.



Royal College of Physicians

Royal College of Physicians

The Royal College of Physicians (RCP) is a British professional membership body dedicated to improving the practice of medicine, chiefly through the accreditation of physicians by examination. Founded by royal charter from King Henry VIII in 1518, as the College of Physicians, the RCP is the oldest medical college in England. It set the first international standard in the classification of diseases, and its library contains medical texts of great historical interest. The college is sometimes referred to as the Royal College of Physicians of London to differentiate it from other similarly named bodies.

The RCP drives improvements in health and healthcare through advocacy, education and research. Its 40,000 members work in hospitals and communities across over 30 medical specialties with around a fifth based in over 80 countries worldwide.

The college hosts six training faculties: the Faculty of Forensic and Legal Medicine, the Faculty for Pharmaceutical Medicine, the Faculty of Occupational Medicine the Faculty of Public Health, the Faculty of Sport and Exercise Medicine and the Faculty of Physician Associates.

The RCP's home in Regent's Park is one of the few post-war buildings to be granted Grade I listed status. In 2016 it was announced that the RCP was to open a new home in the north of England at The Spine, a new building in the Liverpool Knowledge Quarter in Liverpool.[3] The Spine opened in May 2021.

Membership

The MRCP(UK) postnominal is used by doctors who have passed the examinations for the Diploma of Membership of the Royal Colleges of Physicians of the United Kingdom, which are held jointly by all of the UK Royal Colleges of Physicians.[10] Holders of the MRCP(UK) may also become "Collegiate Members" of the London College (using the additional post-nominal MRCP(Lond)) and/or of the other two UK colleges. Affiliate membership of the Royal College of Physicians is a similar level of membership as collegiate membership, but is awarded to senior doctors without MRCP(UK). Both Collegiate Members and Affiliate Members may be considered for advancement to fellowship of the college.

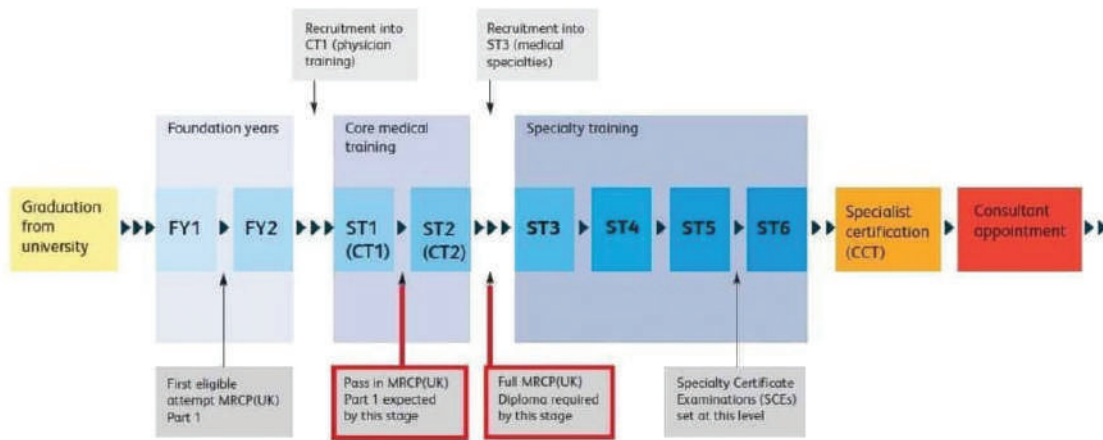
The college also has associate, medical student, and foundation doctor levels of membership.

Fellowship

FRCP, the Fellowship diploma of the Royal College of Physicians

Fellows of the Royal College of Physicians (who use the post-nominal FRCP)[11] are elected mostly from the general membership (collegiate or affiliate), but also occasionally from among the members of the more specialised faculties within the Royal Colleges of Physicians, e.g. Occupational Medicine (MFOM), Pharmaceutical Medicine (MFPM), and Forensic and Legal Medicine (MFLM), etc. There are also fellows who are elected de jure (usually medical experts from other countries) and honoris causa (dignitaries, members of the Royal Family, etc.).[12]

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Medical Fun Facts:

1. Did you know that your ears never stop growing?
2. If you live to age 70, your heart will have beat around 2.5 billion times!
3. Every minute you shed over 30,000 dead skin cells.
4. Did you know that the average nose produces about a cupful of nasal mucus every day?



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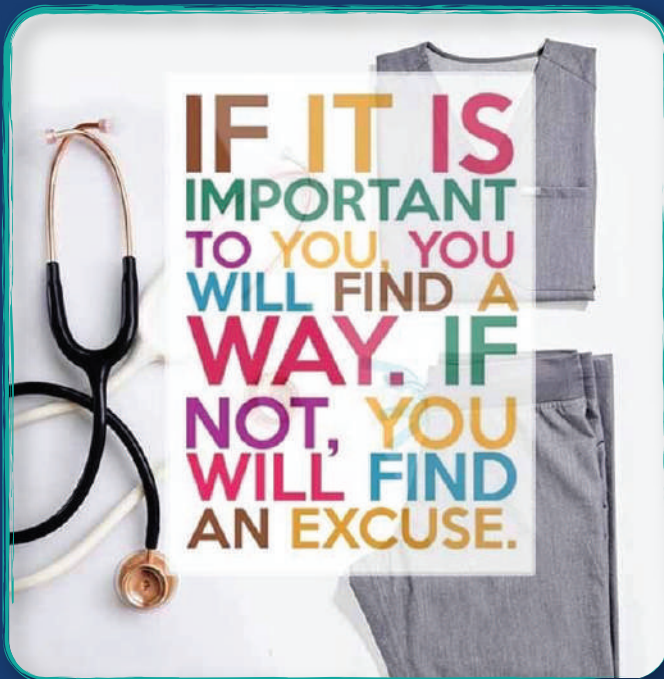
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*A good Physician treats the
disease, the great Physician treats
the patient who has the disease.*

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