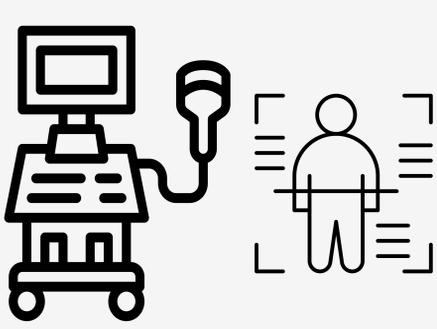


To most learners Point of Care Ultrasound (POCUS) may seem like an enigma full of black and white static. This series aims to demystify US scans into simple infographics that learners can quickly refer to as a refresher.

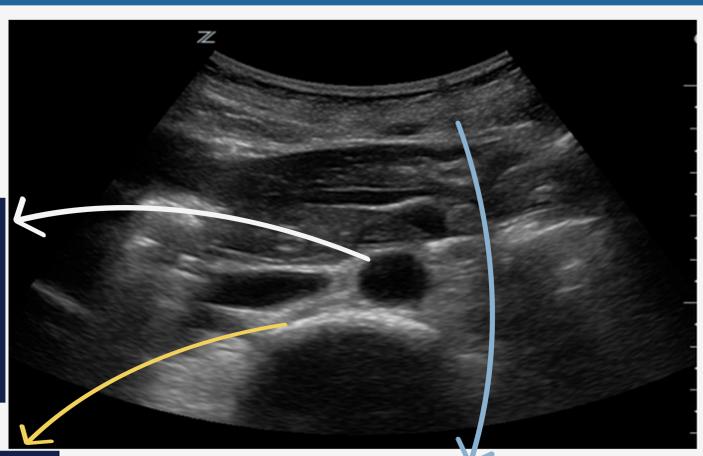
## WHAT IS ULTRASOUND (US)?



An imaging modality that uses **high-frequency** sound waves and their reflection to produce real-time images of various structures

The more waves a structure reflects, the brighter the structure will appear on the screen!

**Black Objects = Anechoic**  
These objects don't reflect any US waves  
**Examples:** Fluids (like blood in the aorta pictured here)



**White Objects = Hyperechoic**  
These objects reflect most of the US waves  
**Examples:** diaphragm, caliculi surface, periosteum (spinal periosteum pictured here)

**Grey objects = Isoechoic**  
These objects reflect some of the US waves  
**Examples:** liver, spleen, uterus, Subcutaneous fat and muscle (pictured here)

## TYPES OF PROBES



### CURVILINEAR

**Low frequency (3.5 mHz)**  
=  
Lower resolution but  
Waves travel further

Visualizes a large area due to curvilinear array of waves  
Excellent for **visualizing the abdominal and pelvic compartment**



### LINEAR

**High frequency (12 mHz)**  
=  
Higher resolution but  
Waves don't travel as far

Used for **imaging vasculature** or **guiding procedures** like central line placement



### PHASED ARRAY

**Sends waves in concurrent phases**  
=  
Excellent for imaging moving structures

Small footprint = easy to maneuver between ribs  
Used to **visualize cardiac structures** + structures in **pediatric patients**

## KNOBLOGY

### DEPTH



#### INCREASED DEPTH

Can see deeper into the abdominal cavity but the object of interest (kidney) is smaller

Adjusts how far you want to see  
  
**Increased Depth**  
=  
**Larger area but Smaller size** of object of interest



#### DECREASED DEPTH

Object of interest (Kidney) is larger but cannot see as deep into the abdominal cavity

**- PoCUS Pearl -**  
Start with maximum depth to scan the largest possible area and then decrease it to centre the object of interest

### GAIN



#### INCREASED GAIN

Brighter image may help differentiate tissues better but can lead to washout of bright structures

**Increased Gain**  
=  
**Brighter image** due to amplification of the return echo  
  
Risk of washing out certain structures

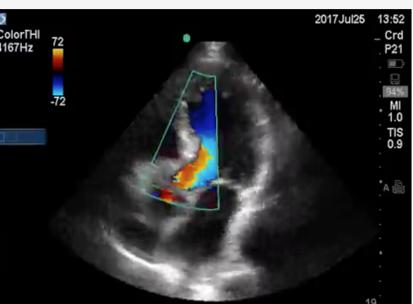


#### DECREASED GAIN

Too low of a gain can give false positives for presence of fluids due to excessive darkening of the image

**- PoCUS Pearl -**  
Gain setting often varies with personal preference and the scan. Find a gain where different tissues appear different shades of grey.

## COLOR DOPPLER



#### BLUE = AWAY

Indicates direction of fluid flow  
  
**BART**  
=  
**Blue Away**  
**Red Toward**  
  
No color = No movement



#### RED = TOWARD