

**問題 1：**肝門(肝門三體，portal triad)不包含下列何者？

1. 總膽管
2. 主門靜脈
3. 肝動脈
4. 肝內膽管

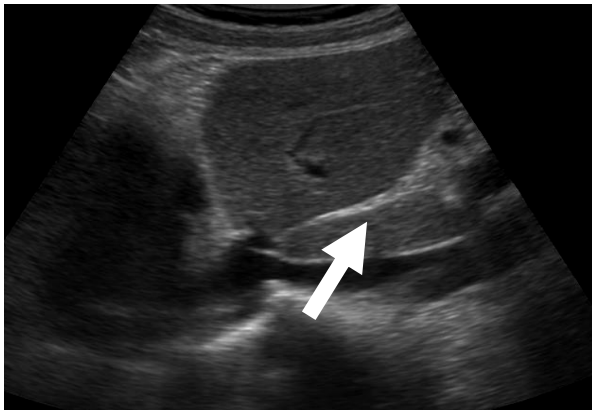
**問題 2：**在嚴重的肝硬化患者身上，不會連帶發現下列何種症狀？

1. 腹水症
2. 肝臟小幅收縮
3. 膽管擴張
4. 門脈性高血壓(portal hypertension)

**問題 3：**下列關於肝門靜脈及肝靜脈的超音波特徵，何者錯誤？

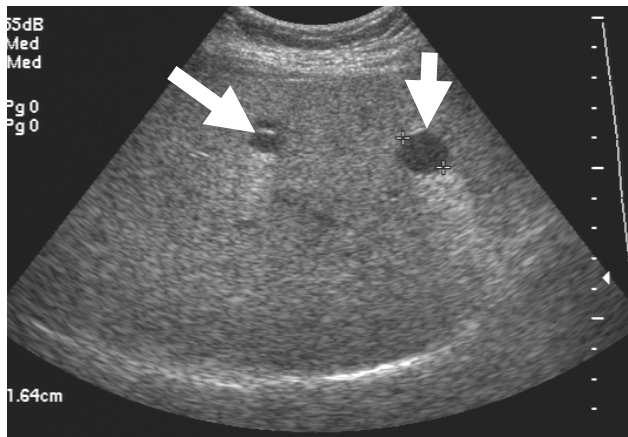
1. 在超音波攝影下，肝門靜脈壁為回波模式，但肝靜脈壁未附帶回波模式
2. 鄰近橫膈膜的靜脈直徑寬，肝門靜脈直徑較窄
3. 肝靜脈血流筆直，肝門靜脈血流蜿蜒曲折
4. 肝靜脈與肝門靜脈的功能為運血至肝臟

**問題 4：**下面的肝臟縱向掃描圖之中，箭頭所指的解剖結構為何？



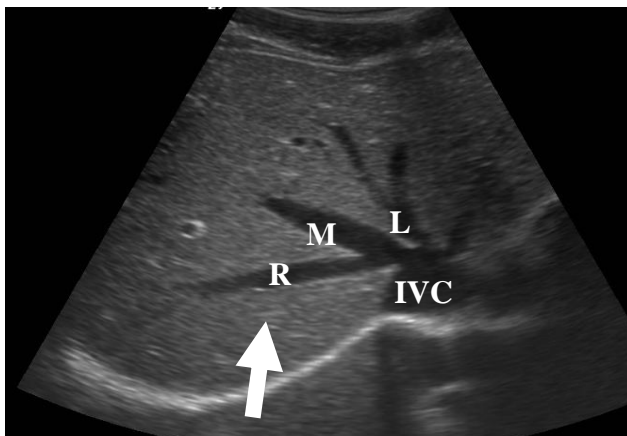
1. 右前葉
2. 左側葉
3. 尾葉
4. 右上葉

**問題 5：**下圖箭頭指出了兩處病變，下列關於這些結構的敘述，何者錯誤？



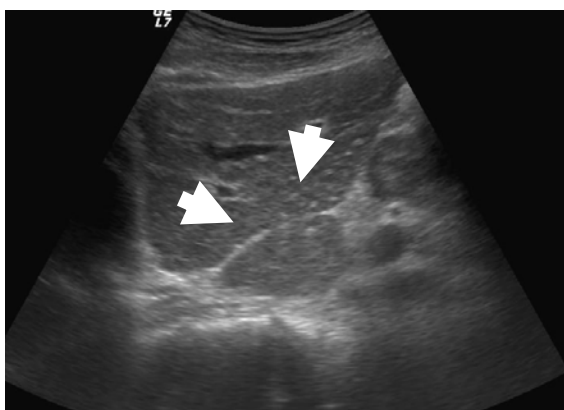
1. 腫瘤形成的體液(Tumor comprised fluid)
2. 腫瘤後方回音增強
3. 診斷為固態腫塊
4. 狀似橢圓形且歸類為良性腫瘤

**問題 6：**下圖中，箭頭所指的解剖結構為何？



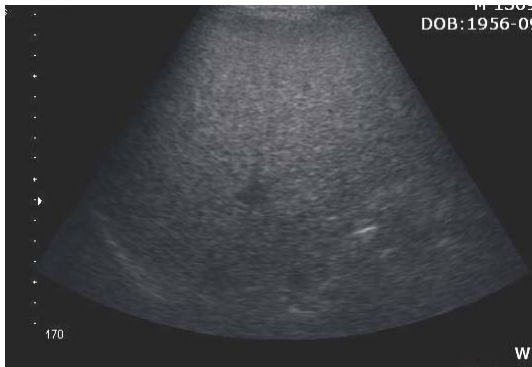
1. 右前葉
2. 左中葉
3. 右後葉
4. 右前上葉

**問題 7：**下面的肝臟縱向掃描圖中，箭頭所指的解剖學結構為何？



1. 靜脈韌帶
2. 圓韌帶
3. 主肝裂
4. 鐮狀韌帶

**問題 8：**這張圖之中，肝薄壁組織回波普遍會增加，肝血管則不清楚。超音波研究將此情形稱為「明亮肝(bright liver)」，在診斷上的名稱為何？



1. 肝硬化
2. 肝濃瘍
3. 肝癌
4. 脂肪肝

**問題 9：**下列關於正常膽道路線的敘述，何者正確？

1. 右、左肝內膽管 - 總肝管 - 總膽管
2. 總膽管 - 總肝管 - 肝內膽管
3. 總肝管 - 共同管道 - 總膽管
4. 總膽管 - 胰腺管 - 共同管道

**問題 10：**若您吃了一餐，何者能讓膽汁流出至十二指腸？

1. 醣原 (glycogen)
2. 胰島素
3. carboxypeptide
4. 膽囊收縮素(cholecystokinin)

**問題 11：**下列關於急性膽囊炎的起因，何者錯誤？

1. 膽結石造成膽囊管阻塞
2. 總膽管與胰腺管堵塞，導致胰臟酵素回流
3. 膽囊息肉
4. 細菌性發炎導致劇毒的生成

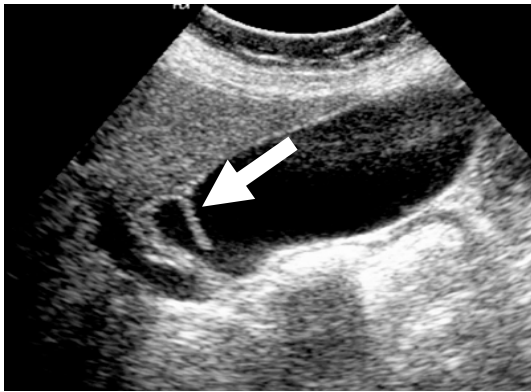
**問題 12：**下列關於膽囊息肉的敘述，何者正確？

1. 一種惡性腫瘤
2. 非經患者移動而附著在膽囊壁
3. 具後方聲波陰影
4. 直徑大於 1 cm，為單音類型

**問題 13：**假設膽囊收縮偏移，其位置標示物為何？

1. 上腸繫膜動脈(superior mesenteric artery)
2. 總肝管
3. 靜脈韌帶
4. 主肝裂

**問題 14：**下列關於箭頭所指處，何者正確？



1. 膽囊息肉
2. 膽囊壁假影
3. 膽囊壁螺旋瓣
4. 膽囊壁形成的接頭絛摺(junctional fold)

**問題 15：**下圖箭頭所指的是何種解剖結構？



1. 遠側總膽管(distal CBD)
2. 脾靜脈
3. 上腸繫膜動脈
4. 胰腺管

**問題 16：**下列何者與胰臟酵素無關？

1. 澱粉酶
2. 脂肪酶
3. 胰蛋白酶
4. 胃泌激素



**問題 17：**下圖為胰臟超音波攝影，箭頭所指的解剖結構為何？



1. Aorta
2. SMA
3. SMV
4. IVC

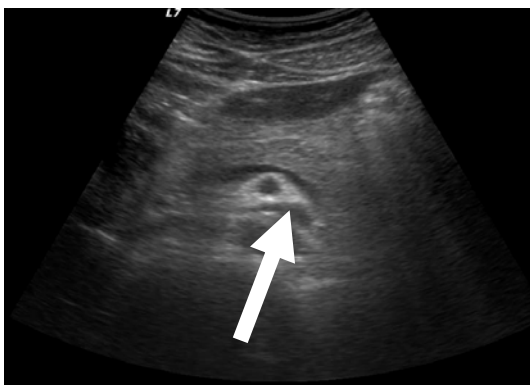
**問題 18：**在胰臟橫向掃描中，胰頭部分前側的解剖結構為何？

1. 總膽管
2. 肝動脈
3. 肝門靜脈
4. 胃十二指腸動脈

**問題 19：**下列關於腎臟解剖的敘述，何者錯誤？

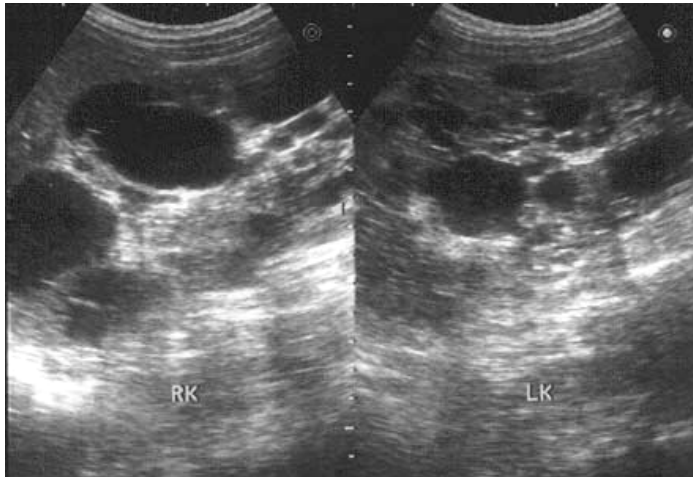
1. 腎臟由皮質與髓質構成。
2. 髓質含有腎元。
3. 排尿過程為次腎盞 - 主腎盞 - 腎盂。
4. 腎竇由血管、脂肪、纖維組織、淋巴管、集尿系統等構成。

**問題 20：**下圖為腹部橫向掃描圖。箭頭所指的解剖組織為何？



1. SMV
2. SMA
3. LRV
4. LRA

**問題 21：**下圖為成年人的多囊腎臟病圖，請問何者錯誤？



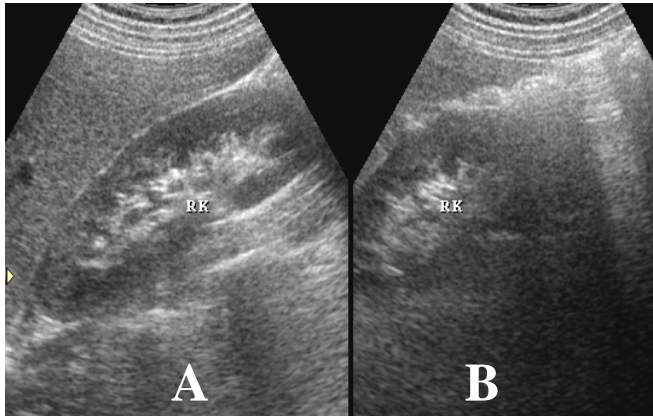
1. 為體染色體顯性多囊性腎臟疾病(ADPKD)。
2. 先天集尿管與管狀發展不良(tubular dysraphism)，導致皮質與髓質出現囊腫。
3. 肝臟能看到約 50%的囊腫，好發於年輕人身上，五十多歲者少見。
4. 因與不明顯的界囊腫(boundary cyst)重疊，因此難以呈現出正常結構。

**問題 22：**下圖為腎水腫超音波攝影圖，下列何者錯誤？



1. 主因為堵塞，輸尿管結石導致輸尿管形成腫瘤。
2. 生理性膨脹腎血管呈現偽陽性。
3. 腎水腫導致腎蓄膿併發症。
4. 懷孕期間，有可能一併出現腎盂、腎盞、輸尿管擴張。此時，左輸尿管擴張幅度較大。

**問題 23：**下列何者為呈現標示A處的最佳掃描法？



1. 飲用約 300 ml 的水以排氣
2. 讓膀胱漲滿
3. 伸出腹部或深呼吸
4. 改為右側臥位置

**問題 24：**下列何者在血液檢查中，為前列腺癌的實用腫瘤標記？

1. AFP
2. PSA
3. HCG
4. ALP

**問題 25：**脾臟切除手術後的脾臟外觀變化為何？

1. 副脾臟
2. 再生脾臟
3. 游離脾臟
4. 倒置脾臟(upside-down spleen)

**問題 26：**下圖箭頭所指的解剖結構為何？

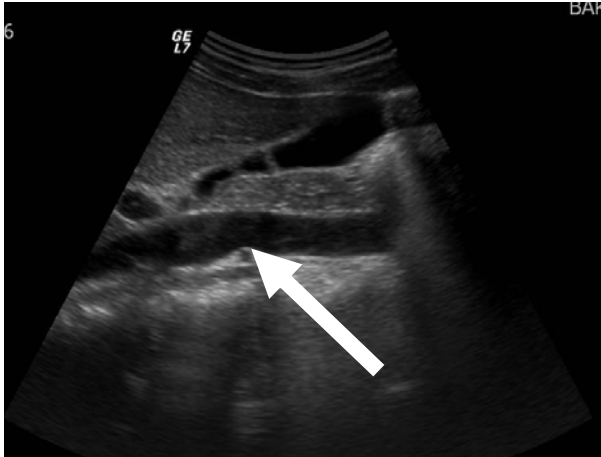


1. 患者若改變位置，易於偵測出腹部所屬部位的集液狀況
2. 標示箭頭區為道格拉氏陷凹(douglas pouch)
3. 右肺有肋膜積液
4. 為橫膈膜後方假影

問題 27：何者不是源自腹腔動脈幹(軸)的分支血管？

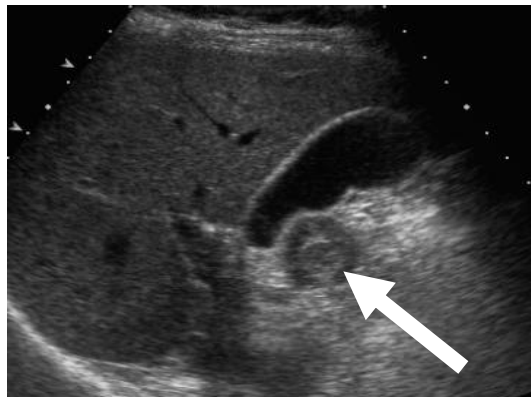
1. 肝動脈
2. 脾動脈
3. SMA
4. 左胃動脈

問題 28：下圖是肝臟的縱向掃描圖，箭頭所指的解剖結構為何？



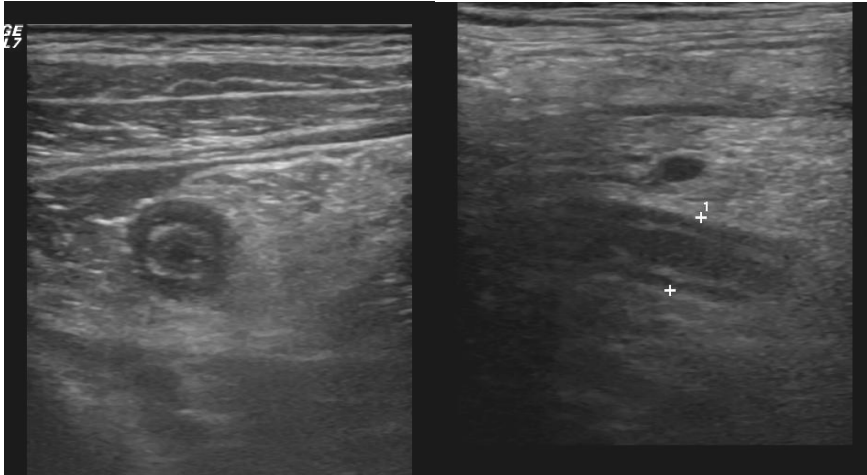
1. 肝門靜脈
2. 膽囊息肉
3. 右腎動脈
4. 左腎靜脈

問題 29：下圖為右肋下方掃描圖，箭頭所指的解剖結構為何？



1. 胰頭
2. 食道
3. 十二指腸
4. 總膽管擴張

問題 30：這是右下腹部掃描圖，最有可能與哪種疾病相關？



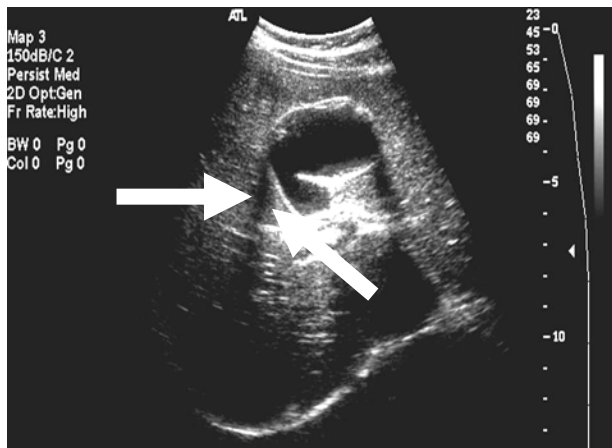
1. 闌尾炎
2. 腸阻塞
3. 結腸炎
4. 憩室炎

問題 31：凸出性(protrude)肝臟腫瘤造成部分橫膈膜升高為鄰近器官，此種超音波臨床徵象稱為什麼？



1. 鍵盤徵象(keyboard sign)
2. 圓丘徵象(hump sign)
3. 群集徵象(cluster sign)
4. 偽腎臟徵象(pseudo kidney sign)

**問題 32：**下圖箭頭所指的解剖結構為何？



1. 射束寬度假影
2. 後方回音增強
3. 邊緣陰影
4. 鏡像假影

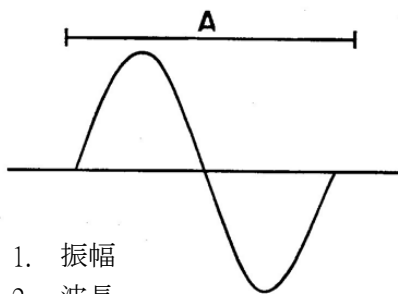
**問題 33：**若兩個結構的解析度與聲束路徑平行，該解析度稱為？

1. 時間解析度
2. 軸向解析度
3. 側向解析度
4. 等距方位解析度(Azimuthal Resolution)

**問題 34：**下面從最快至最慢的音速排列順序，何者正確？

1. 骨頭、脂肪、軟組織、空氣
2. 空氣、脂肪、軟組織、骨頭
3. 骨頭、空氣、脂肪、軟組織
4. 骨頭、軟組織、脂肪、空氣

**問題 35：**下圖標示A處量測的聲音參數為何？



1. 振幅
2. 波長
3. 壓力
4. 脈衝重覆頻率

**問題 36：**假如穿透角不同於入射角，將發生何種情況？

1. 反射
2. 折射
3. 收縮(retraction)
4. 稀疏(rarefaction)

**問題 37：**下列何者與側向解析度的關係最密切？

1. 探頭(transducer)大小
2. 探頭屏蔽
3. 射束寬度
4. 脈衝期間

**問題 38：**換能器晶體聲阻抗(acoustic impedance)為 100。皮膚聲阻抗為 60。下列哪項為聲阻抗值？

1. 160
2. 100
3. 80
4. 60

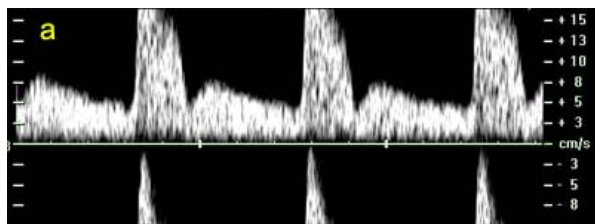
**問題 39：**下列何者最能妥善定義居里點(Curie point)？

1. 所有人造晶體展現壓電特性所需的最低溫度。
2. 超音波元件偶極發生變化的最低溫度。
3. 造成自然晶體融化。
4. 人造晶體喪失壓電特性的最低溫度。

**問題 40：**下列何者為脈衝都卜勒(Pulsed Doppler)優於CW都卜勒(CW Doppler)的主要優點？

1. 範圍解析度較佳
2. 採用頻譜顯示
3. 輸出強度較低
4. 不會產生錯像(alias)

**問題 41：**假設無法增加脈衝重覆頻率，何種做法能消弭或減少觀察到的假影？



1. 提高都卜勒增益
2. 增加掃描速度
3. 降低基線
4. 增加傳送的都卜勒頻率

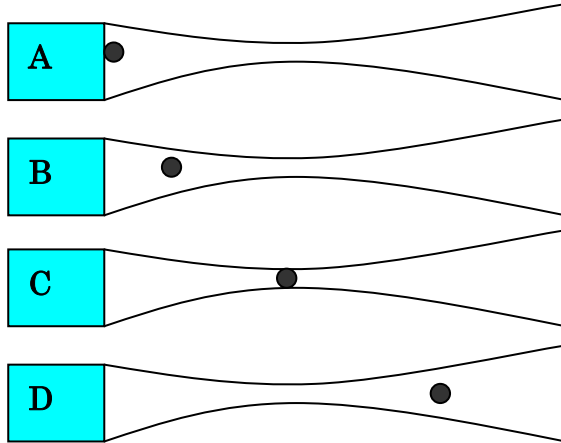
**問題 42：**下列何者最有可能影響扇形掃描的掃描線數量？

1. 扇形角度
2. 電視光柵顯示線數量
3. 換能器頻率
4. 接收器動態範圍

**問題 43：**下列關於TGC目的的敘述，何者最佳？

1. 相較於強回訊，弱回訊會獲得差別放大。
2. 訊號-雜訊比增加。
3. 相較於弱回訊，強回訊會獲得差別放大。
4. 根據抵達時間進行回訊之差別放大。

**問題 44：**請參照附圖，哪種情況能提供最佳的聲波陰影度(acoustic shadowing)？



1. A
2. B
3. C
4. D

**問題 45：**美國醫療用超音波學會(AIUM)的哺乳動物體內生物效應聲明，採用何種強度描述指標？

1. SATA
2. SPTA
3. SPTP
4. SPPA

**問題 46：**下列關於正常肝臟的敘述，何者為真？

1. 正常肝臟的超音波圖(sonogram)，應顯示異質回音性(heterogeneous echogenicity)。
2. 正常肝臟的超音波圖，應徹底顯示同質回音性(homogeneous echogenicity)。
3. 正常肝臟的超音波圖，應顯示平滑輪廓及牛眼焦點區。
4. 正常肝臟的超音波圖，應顯示體液-體液血管之間，散佈著同質回音性。

**問題 47：**下列關於正常肝臟的敘述，何者錯誤？

能夠從肝臟中分辨出肝靜脈與肝門靜脈的原因：

1. 肝靜脈內徑朝下腔靜脈(IVC)增加。
2. 肝門靜脈呈現高回音壁，肝靜脈則呈現低回音壁。
3. 肝門靜脈排空進入下腔靜脈(IVC)。
4. 肝門靜脈於節內流動，肝靜脈則於節間流動。

**問題 48：**下列關於正常肝臟的敘述，何者為真？

1. 靜脈韌帶為靜脈導管的殘餘物(remnant)。
2. 靜脈韌帶為臍靜脈的殘餘物。
3. 靜脈韌帶為動脈導管的殘餘物。
4. 靜脈韌帶為臍動脈的殘餘物。



**問題 49：下列關於正常肝臟的敘述，何者錯誤？**

1. 圓韌帶為靜脈導管的殘餘物(remnant)，並於主肝裂流動。
2. 圓韌帶為臍靜脈的殘餘物，並於左節間裂流動。
3. 圓韌帶為動脈導管的殘餘物，並於左節間裂流動。
4. 圓韌帶為臍靜脈的殘餘物，並於主肝裂流動。

**問題 50：下列關於肝臟的敘述，何者為真？**

1. 鎌狀韌帶於肝門靜脈區分成兩層。
2. 鎌狀韌帶於肝臟後下方分成兩層。
3. 鎌狀韌帶於肝臟上方表面分成兩層。
4. 鎌狀韌帶分成兩層以形成靜脈韌帶和圓韌帶。

**問題 51：下列關於肝臟掃描的敘述，何者為真？**

1. 患者得服用對比劑才能掃描肝臟。
2. 超音波掃描師僅得採用肋下技術來掃描肝臟。
3. 超音波掃描師僅得採用肋間技術來掃描肝臟。
4. 掃描肝臟時，檢查項目若明確集中在肝臟，患者無須採取任何準備。

**問題 52：下列關於肝臟掃描的敘述，何者為真？**

1. 肝臟掃描通常在深呼吸以抬高肝臟來進行。
2. 肝臟掃描通常在深呼吸以盡量將肝臟壓低至肋骨邊緣之下來進行。
3. 肝臟掃描通常在閉氣用力(Valsalva maneuver)下進行。
4. 肝臟掃描通常在深呼吸以盡量將肝臟抬高至肋骨邊緣之上來進行。

**問題 53：下列關於彩色都卜勒肝臟掃描的敘述，何者為真？**

進行彩色都卜勒肝臟掃描時，採用紅色/趨近與藍色/遠離的搭配：

1. 肝門靜脈流始終以紅色顯示，肝靜脈則以藍色顯示。
2. 肝門靜脈流始終以藍色顯示，肝靜脈則以紅色顯示。
3. 因為配色需視換能器相關的血流方向而定，所以，肝門靜脈和肝靜脈可能是紅色或藍色。
4. 總膽管將以紅色或藍色顯示。

**問題 54：下列關於肝臟的敘述，何者為真？**

1. 在 Budd-Chiari 症候群之中，肝門靜脈血流堵塞。
2. 在 Budd-Chiari 症候群之中，肝靜脈血流堵塞。
3. 在 Budd-Chiari 症候群之中，IVC 始終堵塞。
4. 在 Budd-Chiari 症候群之中，肝臟變小。

**問題 55：下列關於門脈性高血壓(portal hypertension)的敘述，何者錯誤？**

1. 門脈性高血壓常隨著圓韌帶(臍靜脈)再通而來。
2. 門脈性高血壓常隨著肝靜脈擴張而來。
3. 門脈性高血壓常隨著脾腫大而來。
4. 門脈性高血壓常隨著靜脈曲張而來。

**問題 56：**這張超音波圖呈現的常見肝臟良性腫瘤，最有可能為何者？



1. 腺癌(adenocarcinoma)
2. 海綿狀血管瘤(cavernous hemangioma)
3. 原發性肝癌(primary hepatoma)
4. 惡性淋巴瘤

**問題 57：**肝硬化及慢性B型肝炎相關的惡性腫瘤為何？

1. 脂肪瘤
2. 惡性淋巴瘤
3. 肝癌
4. 肝膿瘍

**問題 58：**下列關於腹水的敘述，何者為真？

1. 腹水聚集於右側象限(right quadrant)的最初位置為肝門區。
2. 腹水聚集於右側象限的最初位置為腹膜小囊。
3. 腹水聚集於右側象限的最初位置為前膈下方空間。
4. 腹水聚集於右側象限的最初位置為 Morrison' s pouch。

**問題 59：**下列關於肝硬化的敘述，何者為真？

1. 肝硬化初期模樣類似肝臟脂肪浸潤。
2. 肝硬化病情惡化時會導致肝臟腫大。
3. 肝硬化於慢性期逆行。
4. 肝硬化為門脈性高血壓導致。

**問題 60：**下列關於不同出血時期的肝臟血腫模樣敘述，何者為真？

1. 無回音腫塊(anechoic mass) → 複雜腫塊(complex mass) → 無回音腫塊
2. 複雜腫塊 → 無回音腫塊 → 鈣化腫塊
3. 分隔高回音腫塊(septated echogenic mass) → 鈣化腫塊
4. 無回音腫塊 → 複雜腫塊 → 回音腫塊

**問題 61：**下列關於膽囊的敘述，何者錯誤？

1. 長期臥病的慢性疾病患者，其膽囊可能膨脹
2. 膽囊可能於患者進餐後膨脹
3. 進行胃切除手術後的患者，其膽囊可能膨脹
4. 膽管結石患者的膽囊可能膨脹

**問題 62：**下列關於膽囊的敘述，何者為真？

1. 油性飲食可能導致患者膽囊收縮。
2. 糖尿病患者的膽囊可能收縮。
3. 出現 Courvoisier 徵象的膽囊可能收縮。
4. 患者長期節食可能導致膽囊收縮。

**問題 63：**這張超音波圖的哪部分能看到膽結石？



1. 膽囊頸部
2. 膽囊本體
3. 膽囊管
4. 膽囊底

**問題 64：**下列關於膽囊的敘述，何者為真？

1. 急性膽囊炎時，可以在超音波之下，直接看到堵塞囊管。
2. 急性膽囊炎時，若直接掃描膽囊，會偵測到莫非徵象(Murphy's sign)。
3. 急性膽囊炎時，膽囊壁厚度應超過 15 mm。
4. 急性膽囊炎時，膽囊始終完整收縮。

**問題 65：**阻塞性黃疸最常見的起因為何？

1. 膽石症
2. 總膽管結石
3. 無結石性膽囊炎(acalculous cholecystitis)
4. 膽囊炎

**問題 66：**若出現膽管擴張卻沒有堵塞病因時，應考慮下列哪項診斷？

1. 胰頭腺癌
2. 卡羅利病(Caroli's disease)
3. Budd-Chiari 症候群
4. 從胃腸道轉移

**問題 67：**膽囊出現目視可見的息肉病變，卻沒有出現聲波陰影時，應考慮下列哪項診斷？

1. 膽囊炎
2. 膽管炎
3. 具膽固醇結石的膽石症
4. 膽囊癌

**問題 68：**從這張超音波圖，可在胰臟正後方長軸處看到哪種血管？



1. 上腸繫膜動脈
2. 上腸繫膜靜脈
3. 左腎靜脈
4. 脾靜脈

**問題 69：**這張超音波圖的箭頭所指為何？



1. 鉤狀突(uncinate process)
2. 胰頭
3. 胰體
4. 胰尾

**問題 70：**下列關於胰臟的敘述，何者為真？



1. 從這張超音波圖，能看到總膽管位於胰頭短軸處。
2. 從這張超音波圖，能看到總膽管位於胰頭長軸處。
3. 從這張超音波圖，能看到總膽管位於胰頭後方。
4. 從這張超音波圖，能看到總膽管與胰頭的胰管結合。

**問題 71：下列關於胰臟的敘述，何者為真？**

1. 在矢狀切面，能看到位於主動脈前方的胰頭
2. 在矢狀切面，能看到位於 IVC 後方的胰頭。
3. 在矢狀切面，能看到位於主動脈前方的胰體。
4. 在矢狀切面，能看到位於主動脈後方的胰體。

**問題 72：何者是最常見的惡性胰臟腫瘤？**

1. 淋巴瘤
2. 胰島細胞腫瘤(islet cell tumors)
3. 囊腺癌(cystadenocarcinomas)
4. 腺癌(adenocarcinomas)

**問題 73：下列關於腎臟病理的敘述，何者為真？**

1. 最常見的先天腎臟畸形為交叉結合異位症(cross-fused ectopia)。
2. 最常見的先天腎臟畸形為雙套集尿系統。
3. 最常見的先天腎臟畸形為骨盆腎。
4. 最常見的先天腎臟畸形為胸腎。

**問題 74：下列關於腎臟病理的敘述，何者為真？**

交叉結合異位症(cross-fused ectopia)於超音波圖的模樣，最有可能是：

1. 僅出現在身體一側的拉長腎臟
2. 纖維組織峽讓兩個腎臟於端點處結合
3. 發育不全的小型腎臟
4. 骨盆腎

**問題 75：下列關於腎臟病理的敘述，何者為真？**

1. 骨盆腎證明呼吸離軌(respiratory excursion)。
2. 骨盆腎證明蠕動。
3. 骨盆腎不一定能發揮功用。
4. 骨盆腎在解剖學上始終視為完全的現象。

**問題 76：下列關於腎臟病理的敘述，何者為真？**

1. 馬蹄腎一般位於骨盆。
2. 馬蹄腎從腎體一側結合在一起。
3. 馬蹄腎利用通往大血管前方的峽(isthmus)來結合。
4. 馬蹄腎通常從上端結合。

**問題 77：下列關於腎臟的回音關係，何者為真？**

1. 髓質 > 皮質 > 腎竇
2. 腎竇 > 皮質 > 髓質
3. 皮質 > 髓質 > 腎竇
4. 腎竇 > 髓質 > 皮質

**問題 78：何者為出現高回音的良性腎臟固體腫塊？**

1. 威姆氏腫瘤(Wilms' tumor)
2. 神經母細胞瘤
3. 腎盂腫瘤(renal pelvic tumor)
4. 腎臟血管肌肉脂肪瘤(angiomyolipoma)

**問題 79：**下列關於都卜勒頻譜分析的敘述，何者為真？

1. 腎動脈的都卜勒頻譜分析有助於尋找腎囊腫。
2. 腎動脈的都卜勒頻譜分析有助於評估內部狹窄性。
3. 腎動脈的都卜勒頻譜分析有助於尋找腎結石。
4. 腎動脈的都卜勒頻譜分析有助於偵測腎臟異常。

**問題 80：**下列哪些器官位於後腹腔？

1. 胃、肝與脾
2. 胰、腎與脾
3. 胰、膽囊與脾
4. 胰、腎與腎上腺

**問題 81：**下列關於腹部主動脈的敘述，何者錯誤？

1. 往下流動時，轉而偏向身體後側。
2. 往下流動時，轉而偏向身體前側。
3. 在腹部引發的第一條主要血管為腹幹動脈。
4. 中膜較 IVC 為厚。

**問題 82：**下列關於主動脈從上往下的分支敘述，何者正確？

1. 上腸繫膜動脈 → 總腸動脈 → 腎動脈
2. 上腸繫膜動脈 → 下腸繫膜動脈 → 腹腔動脈
3. 上腸繫膜動脈 → 腹腔動脈 → 下腸繫膜動脈
4. 腹腔動脈 → 上腸繫膜動脈 → 下腸繫膜動脈

**問題 83：**下列關於最常見的甲狀腺惡性腫瘤，何者為真？

1. 甲狀腺濾泡狀癌
2. 淋巴瘤
3. 甲狀腺髓質癌
4. 甲狀腺乳突癌

**問題 84：**下列關於這張胃壁超音波圖的敘述，何者為真？



1. 這張胃壁超音波圖符合良性胃潰瘍的標準。
2. 這張胃壁超音波圖符合胃癌的標準。
3. 這張胃壁超音波圖符合黏膜下腫瘤的標準。
4. 這張胃壁超音波圖符合良性胃部息肉的標準。

**問題 85：**下列關於超音波基礎物理現象的敘述，何者錯誤？

1. 建設性干涉係指同相聲波疊加。
2. 強度等於能源除以射束截面面積。
3. 組織內的超音波為橫向聲波。
4. 半值層為按照因子 2 降低射束強度所需的物質數量。

**問題 86：**動態聚焦一般是指：

1. 傳送聚焦
2. 接收聚焦
3. A 與 B
4. 以上皆非

**問題 87：**下列關於超音波即時成像原則及儀器的敘述，何者為真？

1. 能調整複合線性陣列以拓寬視野。
2. 利用電力調整環狀陣列。
3. 射束調整(beam steering)導致凸形陣列產生大量間溢波(grating lobes)。
4. 能利用機械或電力方式隔離陣列，以免造成交替干擾。

**問題 88：**下列關於都卜勒效應的敘述，何者為真？

1. 都卜勒偏移係指傳送頻率與觀察所得頻率之間的差異。
2. 都卜勒偏移量端視來源與接收器之間的相對速度而定。
3. 最大都卜勒偏移發生於超音波傳送方向與移動成垂直之時。
4. A 與 B 為真。

**問題 89：**影像資料採取平滑後處理技術的用意為：

1. 降低隨機雜訊
2. 減少像素大小
3. 灰階重分配
4. 加強空間解析度

**問題 90：**彗星尾假影(comet tail artifact)與何者有關？

1. 反振
2. 共振
3. 衰減
4. 以上皆非

Q1. Which is NOT correct about the acoustic variable ?

- (1). pressure
- (2). density
- (3). temperature
- (4). frequency

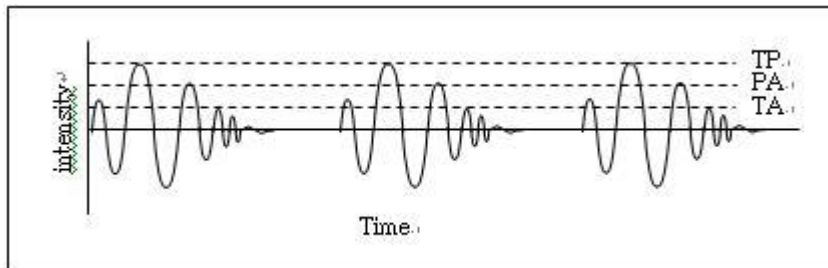
Q2. When the intensity is changed to -6 dB, how much the final intensity is changed from the previous intensity ?

- (1). 1/4 times
- (2). 4 times
- (3). 1/10 times
- (4). 10 times

Q3. Which is correct about the condition of refraction when the ultrasound passes the two media?

- (1). Different acoustic resistance and perpendicular to the acoustic interface
- (2). Different density and perpendicular to the acoustic interface
- (3). Different propagation velocity and inclined to the acoustic interface
- (4). The same acoustic resistance and inclined to the acoustic interface

Q4. The following is the beam temporal intensity of pulsed wave form. Which is the lowest intensity?



- (1). TP (temporal peak)
- (2). PA (pulse average)
- (3). TA (temporal average)
- (4). SP (spatial peak)

Q5. Which is the correct reason of focusing at the ultrasound examination?

- (1). To improve the axial resolution
- (2). To lengthen the close range field
- (3). To increase the beam divergence angle
- (4). To improve the lateral resolution

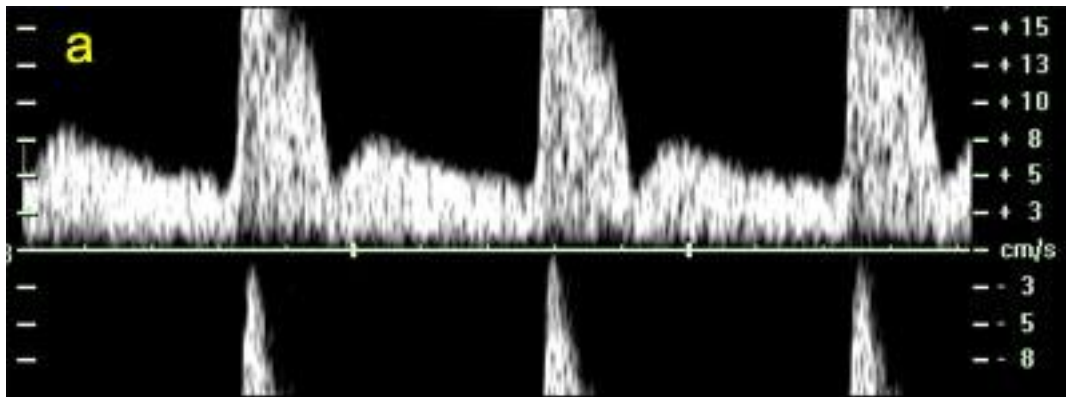
Q6. Which is the proper thickness of matching layer at the transducer?

- (1). 2/3 of wave length
- (2). 1/4 of wave length
- (3). 1/2 of wave length



(4).  $\frac{3}{4}$  of wave length

Q7. Supposing that the pulse repetition frequency doesn't increase, which of the following method can remove or reduce the following picture's phenomenon?

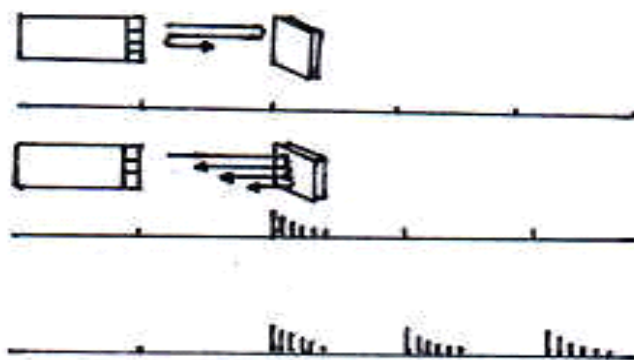


- (1). To increase the Doppler gain
- (2). To lower the baseline
- (3). To increase the sweep speed
- (4). To increase the transmission Doppler frequency

Q8. Which of the following determine the Nyquist limit at the Doppler study?

- (1). Resonance frequency
- (2). doppler angle
- (3). scatterer speed
- (4). PRF(Pulse repetition frequency)

Q9. Which of the following is correct about the following picture's occurrence principle of artifact?



- (1). Shadowing artifact
- (2). Multipath artifact
- (3). Comet tail artifact
- (4). Mirror image artifact

Q10. From the following picture of ultrasound phantom, which performance of equipment dose the arrow evaluate?



- (1). Dead Zone Resolution
- (2). Focal Zone
- (3). Sensitivity
- (4). Gray Scale

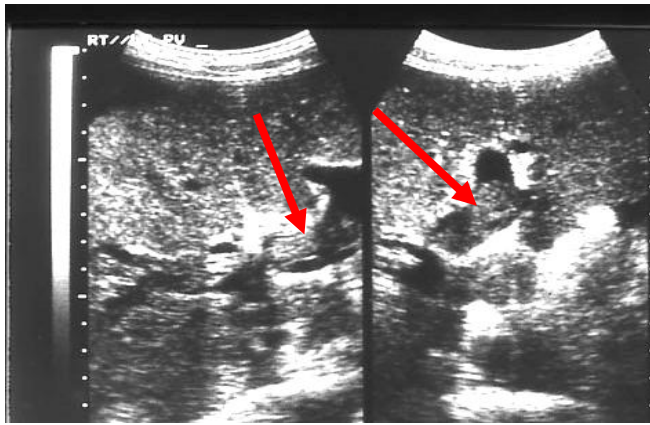
Q11. Which of the following is NOT correct about the equipment QA/QC?

- (1). It's all sorts of action to maintain the image quality consistently.
- (2). We can find the change from equipment quality lowering or general deterioration
- (3). The measurement is needed when breakdown or trouble are occurred to optimize the equipment's performance.
- (4). It can reduce the time of equipment maintenance or reexamination.

Q12. Which of the following is NOT a correct clinicopathologic examination item to evaluate the existence and nonexistence of disease of liver?

- (1). bilirubin
- (2). serum protein
- (3). prothrombin time
- (4). amylase

Q13. The formation of solid tissue similar to the echo pattern of liver parenchyma in the arrow sites of portal vein branch is confirmed. Which of the following is the diagnostic view?



- (1). hematoma
- (2). thrombus
- (3). Clot
- (4). Atheroma

Q14. Which organ's enlargement dose the Klatskin tumor can confirm?

- (1). gall bladder
- (2). extrahepatic duct only
- (3). intrahepatic duct
- (4). intrahepatic and extrahepatic ducts

Q15. which of the following is the arrow site ultrasonic clinical sign to represent the enlargement of intrahepatic biliary duct?



- (1). drum stick sign
- (2). keyboard sign
- (3). hump sign
- (4). pararel channel sign

Q16. Ascites is common at the findings of epigastric examination. Which of the following is NOT the disease that accompanying ascites?

- (1). liver cirrhosis
- (2). congestive heart failure

- (3). nephrotic syndrome
- (4). adenomyomatosis

Q17. It is common among women and represented Tongue-like projection at the right hepatic lobe. Which of the following is this liver anomaly?

- (1). Reidel's lobe
- (2). Biliary cystadenoma
- (3). Cavernous hemangioma
- (4). Situs inversus

Q18. Which of the following is NOT correct about the cause of gallbladder enlargement?

- (1). prolonged fasting
- (2). ascites in the peritoneum
- (3). IV hyperalimentation
- (4). Cystic duct obstruction (Hydrops of gallbladder)

Q19. Which of the following is NOT correct about the ultrasound finding of acute cholecystitis?

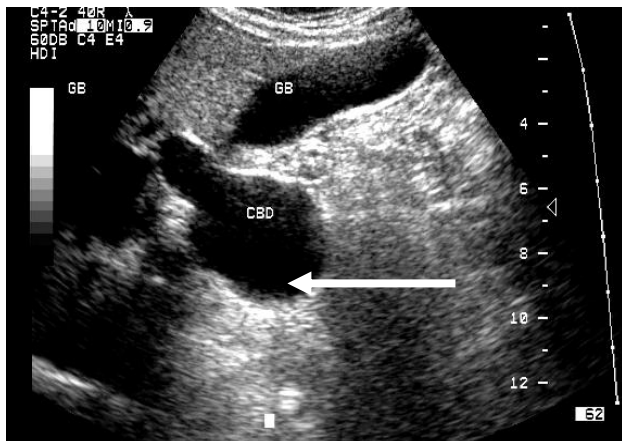
- (1). Cystic duct atresia from cystic stone
- (2). Gall bladder hypertrophy and gall bladder wall thickening
- (3). Intra-gall bladder fluid-sludge level and wall sonolucent Halo
- (4). Atrophy of gall bladder wall and intra-gall bladder stone

Q20. From the following image, Which of the following is the gall bladder disease that accompanying gall bladder wall thickening and Comet tail sign because of abnormal growth of gall bladder mucosa?



- (1). Adenomyomatosis
- (2). GB Polyp
- (3). Porcelain gallbladder
- (4). GB Empyema

Q21. The common bile duct represent cystic enlargement(arrow). The pathogenesis is estimated congenital and it accompanies cholelithiasis and cholangioma higher than normal. Which of the following is this disease?



- (1). Cholangitis
- (2). Adenomyomatosis
- (3). Biliary cystadenoma
- (4). Choledocal cyst

Q22. Which of the following is the typical form of pancreatic cancer?

- (1). cystic neoplasm
- (2). insulinoma
- (3). adenocarcinoma
- (4). gastrinoma

Q23. Which of the following is correct about the acute pancreatitis?

- (1). The pancreas looks like atrophy.
- (2). The pancreatic duct is enlarged and the stone can be sown in it.
- (3). Primary pancreatitis looks like normal but as the inflammation is progressed, the low echo pancreas size is enlarged.
- (4). The serum amylase and lipase decreases.

Q24. Which of the following is NOT correct about the characteristic of ultrasound image of pancreatic cancer?

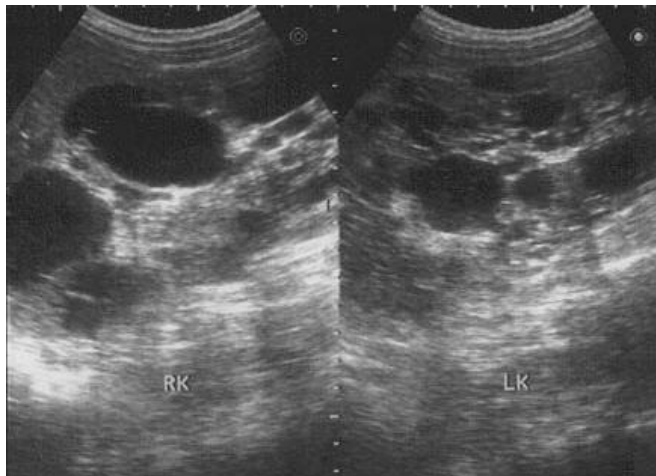
- (1). it represents locally
- (2). The intensity of tumor echo mostly represents high.
- (3). It represents lobulated margin..
- (4). The cancer of head enlarges pancreatic duct and common bile duct.

Q25. Which of the following can be shown at the antero-lateral portion of pancreas head in the transverse scan of pancreas?

- (1). common bile duct
- (2). hepatic artery

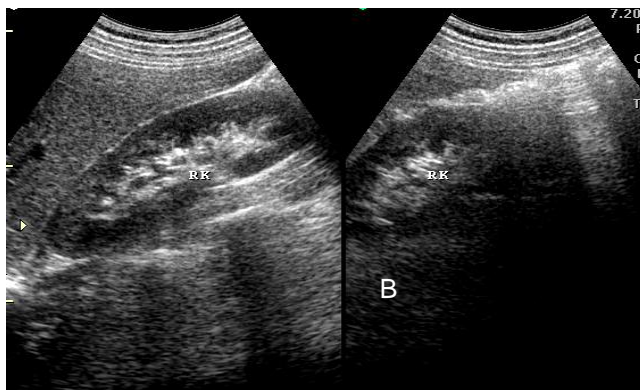
- (3). portal vein
- (4). gastroduodenal artery

Q26. Which of the following is NOT correct about the polycystic kidney disease?



- (1). It is called autosomal dominant polycystic kidney disease (ADPKD)
- (2). The cystoma occurs at the cortex and medulla because of the congenital dysplasia of collecting duct and tubule.
- (3). It represents 50% at the liver and occurs mainly at the adolescence and the incidence rate is low in one's late fifties
- (4). The normal structure cannot be shown because the fuzzy boundary cystoma occupies the kidney central part

Q27. How to scan to improve the ultrasound image like B to the left image?



- (1). Drink water about 300ml to remove gas
- (2). Fill the urinary bladder with urine
- (3). Fill the underbelly and take in a deep breath.
- (4). Position the patient to the right lateral decubitus position

Q28. Which of the following is NOT true about kidney anatomy?

- (1). It is located in the peritoneum
- (2). Kidney is surrounded by Gerota's fascia
- (3). Perirenal fascia is prevented renal abscess which is spread into the abdomen

- (4). Kidney comprised cortex, medulla, and sinus

Q29. Which of the following is NOT true about vessel which were branched from celiac trunk(axis) ?

- (1). hepatic artery
- (2). splenic artery
- (3). SMA
- (4). left gastric artery

Q30. Which is the most low rate in the pediatric US exam?

- (1). Intussusception
- (2). Hypertrophic pyloric stenosis
- (3). Acute appendicitis
- (4). Gall stone

Q31. Which of the following is NOT true about pancreatic abscess ?

- (1). It means pancreatic necrosis
- (2). Coliform bacteria is formed
- (3). It shows a gas bubbles in the ultrasound image
- (4). It is not need to aspiration for the confirm the disease

Q32. Which of the following is true about porcelain gallbladder ?

- (1). It is processed as secondary by acute cholecystitis
- (2). It shows a strong echo along the GB wall
- (3). It is move according the patient position
- (4). It is seen strong echo pattern, but there is no posterior shadow

Q33. Which of the following is true about Mirizzi's Syndrome ?

- (1). This is hepatocholangitis which accompany high fever, chilling, abdominal pain, jaundice due to bile duct stone in the intrahepatic duct
- (2). It is possible to check the stone and expansion of intrahepatic duct and extrahepatic duct
- (3). This is disease that it give rise to obstructive jaundice from inflammatory stricture or common duct's narrowing due to cystic duct or post-GB excision's residual stone.
- (4). The stone was fixed due to bile duct which was obstructed bile duct or hepatic portriad duct

Q34. Which of the following is NOT true about spleen?

- (1). This make Indirect bilirubin
- (2). red pulp is related with reticuloendothelial system
- (3). white pulp is related with lymphatic system
- (4). It is related with red blood destruction and production

Q35. This image shows that liver size is shrunken remarkably, spleen is larged, accompanying expansion of abdomen area with lots of ascites. What's arrow pointed?



- (1). reverberation artifact
- (2). floating bowel
- (3). falciform ligament
- (4). collateral varicous veins

Q36. Which of the following is NOT true about Liver Congestion image?



- (1). It is general that it occur in the secondary change from heart disease such as right heart failure
- (2). It accompany the expansion of hepatic vein or IVC
- (3). There is a increased size of liver and wall-thickening of GB
- (4). In case of the expansion of hepatic vein, it means Budd-Chari symptom, especially the exan processd considering the obstruction of aorta

Q37. Which is the cancer marker to distinguish the liver cancer?

- (1). -fetoprotein
- (2). White blood count
- (3). Blood urea nitrogen
- (4). Alkarine phosphatase



Q38. Which of the following is NOT related with bladder malignancy tumor

- (1). Most of bladder malignancy tumor is squamous epithelial cell cancer.
- (2). Symptom is mainly painless hematuria
- (3). For the further evaluation , cystoscopy and biopsy are needed.
- (4). To confirm exactly the mass(blood clot), it is need to change the position

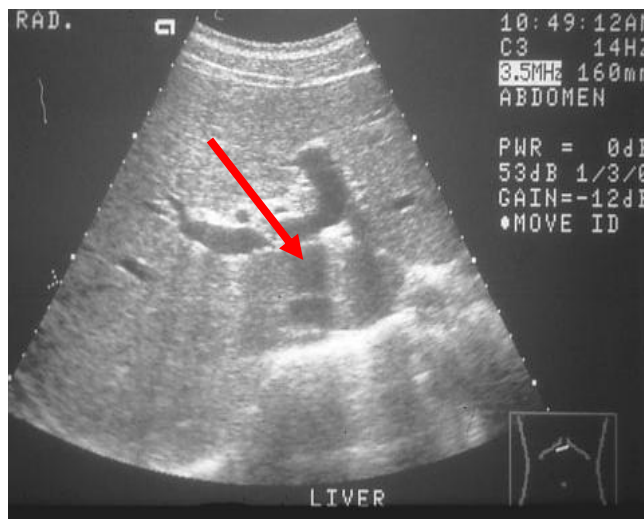
Q39. Which of the following is NOT true about lymph node ?

- (1). Normal lymph node is not seen in the ultrasound image
- (2). It is general that high frequency probe is used due to normal lymph node is located in the deep area and it is small
- (3). Generally lymph node in the abdomen size is less than 1cm
- (4). High frequency probe(7.5-10MHz) is used for neck area lymph node

Q40. Which of the following is NOT true about acute nephronephritis ?

- (1). It is appeared as a abnormal image in the early ultrasound exam
- (2). Most of nephronephritis is caused by reflux of urine
- (3). It is occurred more female than male
- (4). Kidney size is increase

Q41. Which segment of the following arrow mark in the Couinaud 8 segment?



- (1). Segment 1
- (2). Segment 2
- (3). Segment 3
- (4). Segment 4

Q42. Which of the following is true about venosum which is pointed as a arrow ?



- (1). This is distinguishing line for right and left lobe of liver
- (2). This is borderline between caudate lobe and medial segment in the left lobe
- (3). This is borderline between caudate lobe and lateral segment in the left lobe
- (4). This is borderline between anterior segment and posterior segment in the right lobe

Q43. Which of the following is true about suggested image?



- (1). Acute hepatitis
- (2). Focal Fatty liver
- (3). Obstructive jaundice
- (4). Liver cirrhosis

Q44. Which is the component to excrete bile juice to duodenum when we have meal ?

- (1). Glycogen
- (2). Insulin
- (3). Carboxypeptide
- (4). Cholecystokinin

Q45. Which of the following is true about arrow area in the female lower part ?

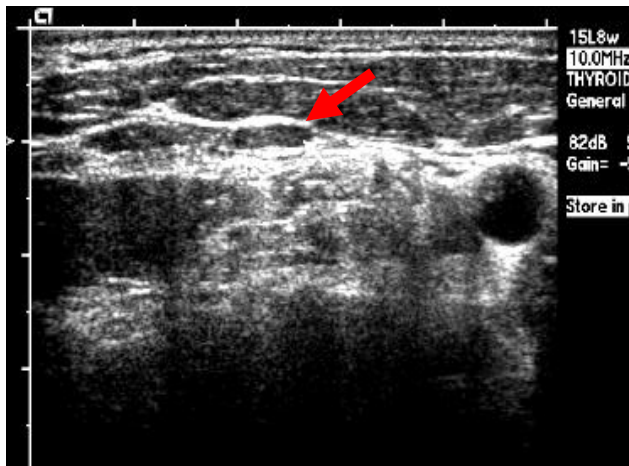


- (1). Endometrium
- (2). Follicle
- (3). Rectum wall
- (4). Cervix

Q46. Which of the following is true about autoimmunity in the head and neck throid ultrasound exam?

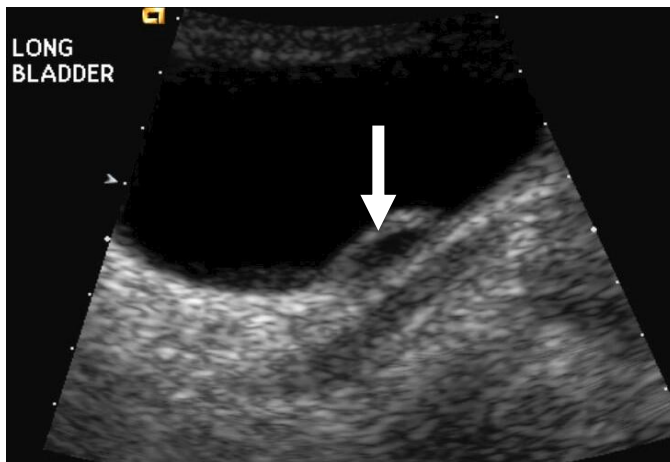
- (1). Hashimoto's thyroiditis
- (2). Follicular carcinoma
- (3). Lymphoma
- (4). Colloid cyst

Q47. This image is perineck lymphnode. Which of the following is true about normal lymphnode ?



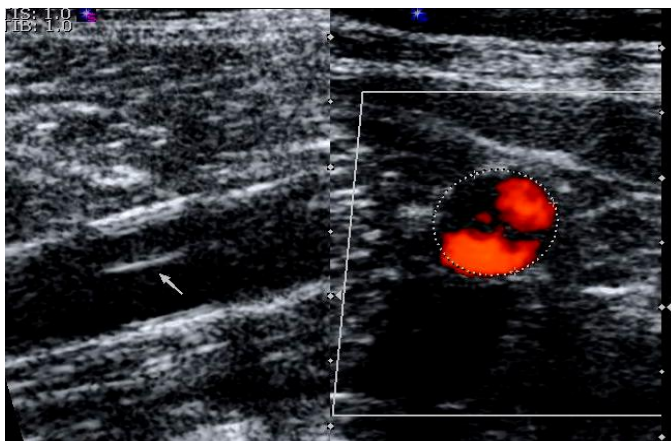
- (1). Irregular inner echo pattern
- (2). Shape is round type, not ellipsoid
- (3). the center of lymphnode is seen hyperechoic hilum
- (4). There is a node chain at the back of SCM(Sternocleidomastoid Muscle) and IJV(Internal Jugular Vein)

Q48. Which of the following is NOT true about Ureter cyst?



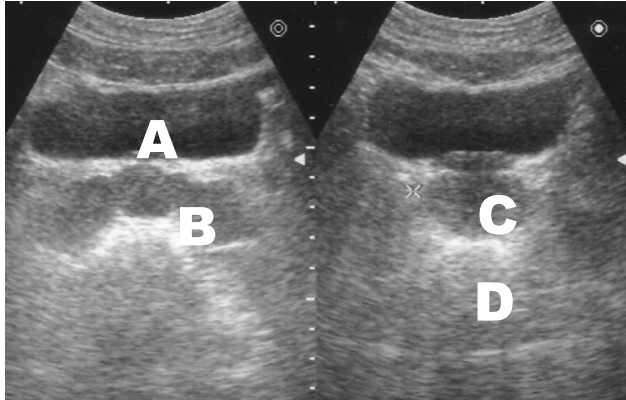
- (1). It is expanded as a congenital cyst of peripheral ureter part
- (2). It is sometimes protected outside of bladder
- (3). Ureter cyst is composed of ureter and bladder mucosa
- (4). Ureter cyst is accompany ureter ectopic and mild expansion

Q49. This is abdominal aorta's longitudinal view like a abdominal aorta's transverse view. Which is the proper disease ?



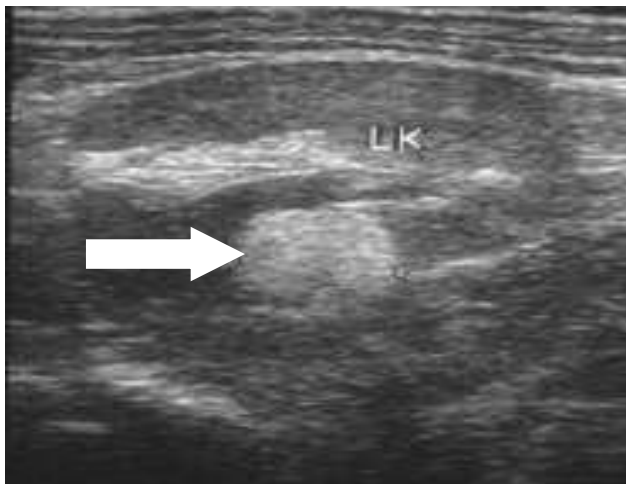
- (1). abdominal aortic aneurysm
- (2). Aortic dissection
- (3). atherosclerosis
- (4). deep vein thrombosis

Q50. Which of the following is NOT true about anatomical structure?



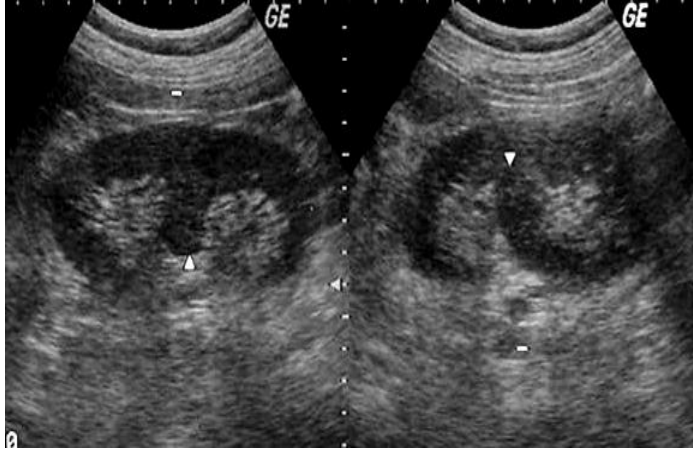
- (1). A-bladder
- (2). B- seminal vesicle
- (3). C- prostate transverse scan
- (4). D- rectum longitudinal scan

Q51. This image is angiomyolipoma. Which of the following is false?



- (1). This tumor comprised vessel, smooth muscle, fat tissue
- (2). This is detected in ultrasound exam without symptom
- (3). Most of this case is seen hyperecho
- (4). If patient position is change, echo pattern is changed. It is call chameleon sign.

Q52. This image is renal column hyperplasia. Which of the following is true



- (1). renal column hyperplasia is seen in the renal parenchyma
- (2). renal column echo is similar to renal cortex
- (3). renal column protected from renal sinus to cortex
- (4). With more than 5cm, it give rise to renal sinus bleeding

Q53. Which is not related reason with splenic infarct ?

- (1). splenomegaly
- (2). thrombosis
- (3). pancreatitis
- (4). Leukemia

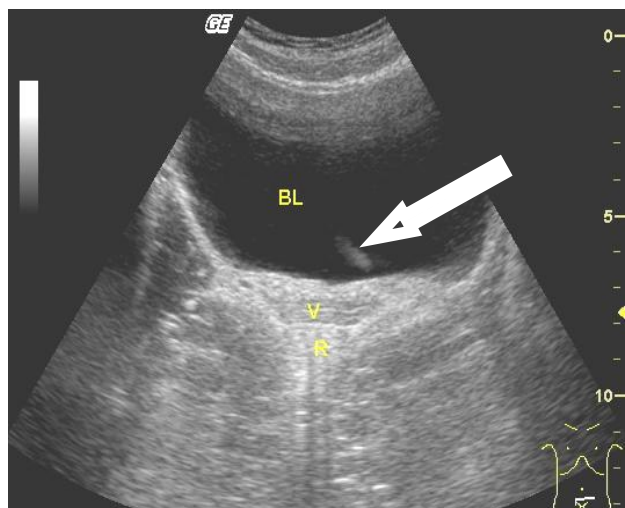
Q54. Which is splenic variation after spleen excision?

- (1). accessory spleen
- (2). born-again spleen
- (3). wandering spleen
- (4). upside-down spleen

Q55. Pancreas pseudocyst is occur each 50% in the inner and outer part. Which is area is the most occur in the extrapancreatic?

- (1). porta hepatis
- (2). mediastinum
- (3). greater sac
- (4). lesser sac of anterior pararenal space

Q56. Which of the following is true about bladder?



- (1). Normal bladder wall is seen smooth
- (2). When the bladder is filled with urine, bladder wall thickness is 7mm
- (3). Arrow is excreting jet stream, even though the urine is a little, it is seen
- (4). Side lobe artifact is always exist in the bladder scan

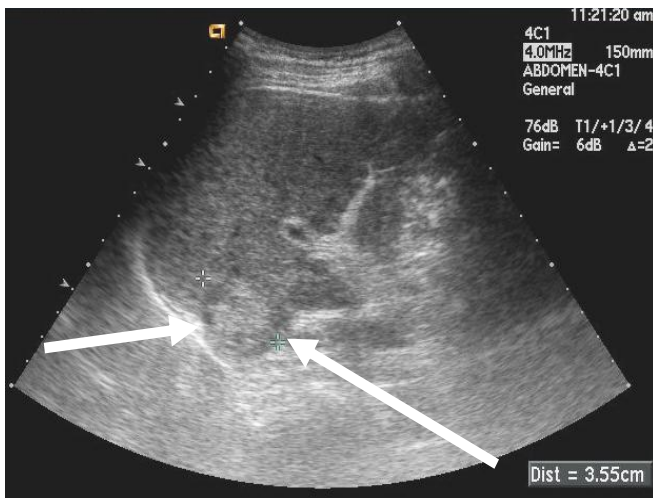
Q57. Which is not related with suggested image?



- (1). liver cirrhosis
- (2). ascites
- (3). GB stones
- (4). Metastasis

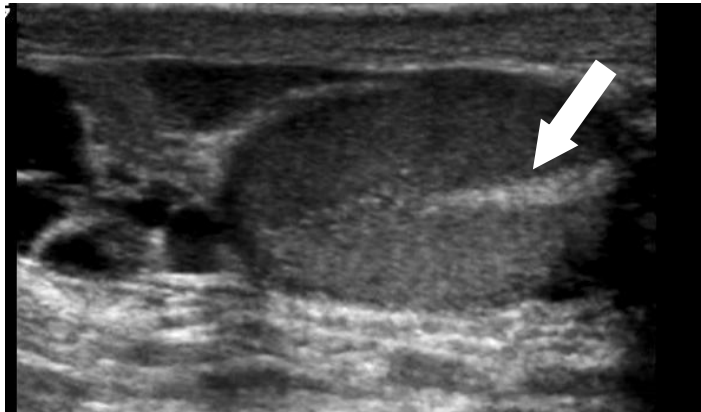


Q58. This image shows that a part of diaphragm was elevated due to projected hepatic tumor. What is call this type of sign ?



- (1). keyboard sign
- (2). hump sign
- (3). cluster sign
- (4). pseudo kidney sign

Q59. Which of the following is true about arrow area?



- (1). seminoma
- (2). mediastinum
- (3). medulla
- (4). epididymis

Q60. Which of the following is Not correct about reticuloendothelial system ?

- (1). It is called phagocytosis white blood cell
- (2). This is localize spleen
- (3). reticuloendothelial system's roll is the protection from outer inflammation
- (4). There is a cuffer cell as a liver reticuloendothelial cell



Q61. Which of the following is Not correct about the influence to neighborhood organs by lymphadenopathy ?

- (1). Duct is obstructed by extrahepatic duct's narrowing
- (2). Artery is obstructed by aorta's narrowing
- (3). The location is moved forward by IVC's narrowing
- (4). Hydronephrosis is occurred by ureter's narrowing

Q62. Which anatomical structure is not seen in the abdomen longitudinal scan?

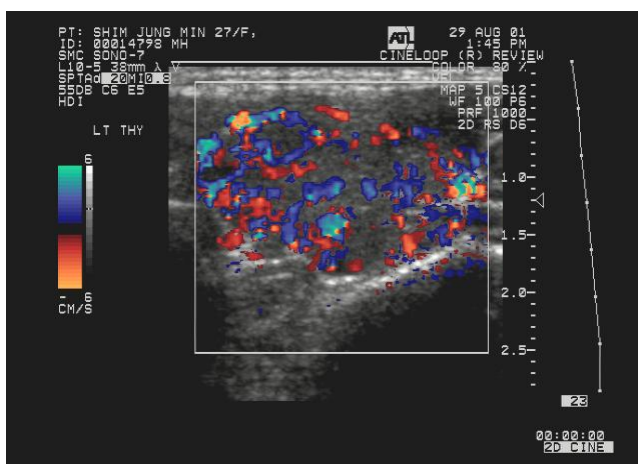


- (1). portal vein
- (2). GB
- (3). Rt renal artery
- (4). aorta

Q63. Which of the following is Not correct about the influence of pancreas head cancer?

- (1). CBD obstruction
- (2). Couvoisier's sign
- (3). Expansion of ampulla of vater
- (4). Panceas duct obstruction

Q64. Which is related with head and neck color ultrasound image?



- (1). thyroiditis
- (2). papillary ca
- (3). sialoadenitis
- (4). Hypertrophy of lymphatic duct

Q65. Which of the following is Not correct about RCC(Renal cell carcinoma)?

- (1). The reason is smoking and meal
- (2). The main symptom is hematuria, flank pain, abdominal mass
- (3). This is seen hypovascular pattern in the angiography
- (4). Hypertension is due to the overproduction of renin

Q66. Which part is well seen to Lt. renal vein in the transverse scan ?

- (1). In front of IVC
- (2). At the back of aorta
- (3). Between SMA and aorta
- (4). Between IMA and aorta

Q67. Which component is insufficient in the blood plasma of ascites ?

- (1). fibrinogen
- (2). prothrombin
- (3). albumin
- (4). heparin

Q68. Which disease is closely related with SGOT(serum glutamin oxalocetic transaminase)and SGPT(serum glutamin pyruvic transaminase)?

- (1). viral hepatitis and toxic hepatitis
- (2). obstructive disease
- (3). chronic cholecystitis
- (4). cholangitis

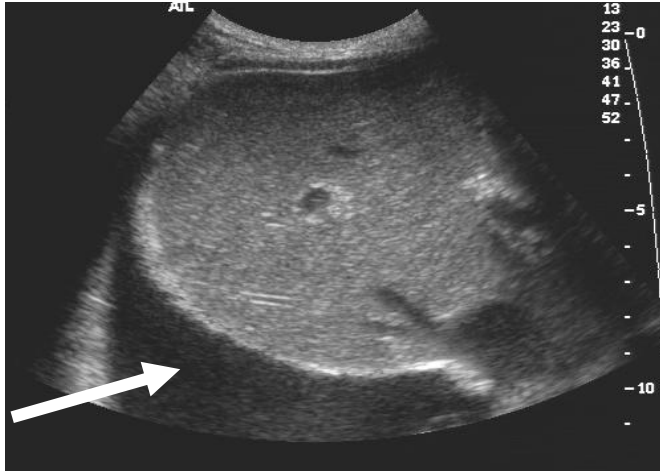
Q69. Which of the following is Not correct about the anatomy of kidney ?

- (1). Kidney is composed of cortex and medulla
- (2). Medulla comprised nephron which is the functional unit of kidney
- (3). Urin's excretion order is minor calyceal-major calyceal-renal pelvis
- (4). Renal sinus is composed of vessel, fat, fibro tissue, lymphatic duct, collection system.

Q70. Which of the following is Not correct about Wilms' tumor ?

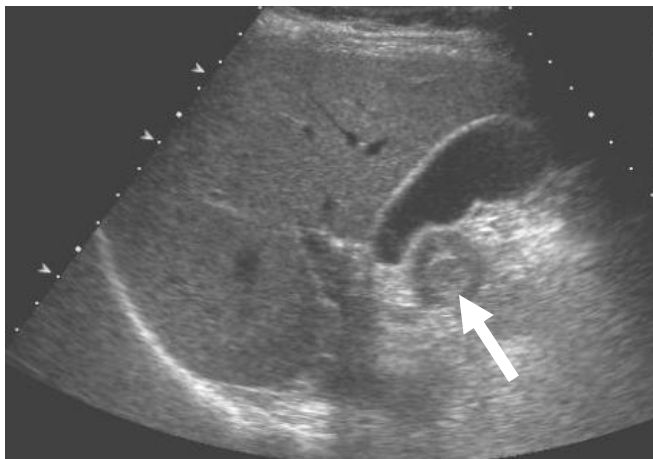
- (1). This is the solid tumor which was detected in the infant abdomen
- (2). This is frequently occurred between 1year and 3years.
- (3). This is observed with hypo-echo pattern by necrosis or hemorrhage
- (4). This is not metastasized to other organ as a benign tumor

Q71. Which of the following is true about arrow pointed?



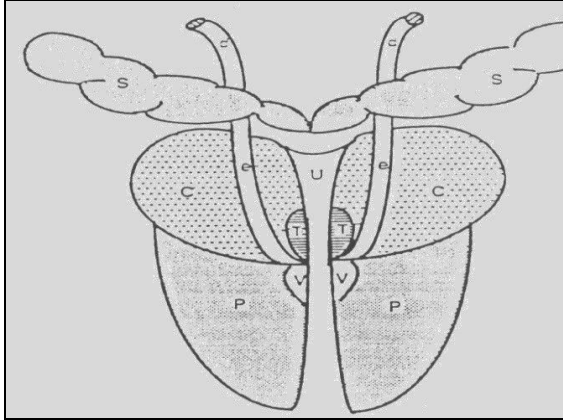
- (1). This fluid collection is well observed in the dependent portion of abdomen in case of patient position is changed.
- (2). Fluid collection's location which was suggested image is douglas pouch.
- (3). This is pleural effusion which was accompany in the right lung
- (4). This is the artifact which is not exgist in the posterior of diaphragm

Q72. This image was scanned by right subcostal arch. What is this(arrow)?



- (1). pancreas head
- (2). esophagus
- (3). duodenum
- (4). dilatation of CBD

Q73. Which part is mainly occur BPH(Benign prostatic hypertrophy)?



- (1). V (verumontanum)
- (2). T (transitional Zone)
- (3). C (central Zone)
- (4). P (peripheral Zone)

Q74. Which of the following is Not correct about portal hypertension ?

- (1). Sometimes this accompany the recanalization of ligamentum teres (umbilical vein).
- (2). Sometimes this accompany the expansion of hepatic veins.
- (3). Sometimes this accompany splenomegaly
- (4). Sometimes this accompany esophageal varices

Q75. Lateral resolution is most closely associated with ?

- (1). Beam width
- (2). Spatial pulse length
- (3). Transducer size
- (4). Pulse duration

Q76. Approximately how much time passes between pulse transmission and echo reception from a 5 cm deep interface?

- (1). 13  $\mu$ s
- (2). 65  $\mu$ s
- (3). 39  $\mu$ s
- (4). 130  $\mu$ s

Q77. The signal processing technique of time-gain compensation (TGC) attempts to correct for \_\_\_\_\_ of the ultrasound beam ?

- (1). velocity change
- (2). attenuation
- (3). reflection
- (4). Refraction

Q78. Which of the following cannot find in the region of cyst?

- (1). echo-free
- (2). acoustic shadowing
- (3). well-defined margin
- (4). acoustic enhancement

Q79. What causes reflection at a tissue interface?

- (1). absorption
- (2). attenuation
- (3). impedance change
- (4). velocity change

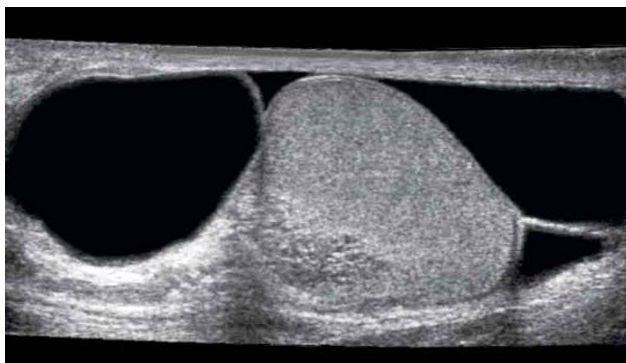
Q80. Calculate the near-field depth for a 5 mm diameter crystal operating at 5 MHz.

- (1). 20 mm
- (2). 10 mm
- (3). 2 mm
- (4). 5 mm

Q81. According to the American Institute of Ultrasound in Medicine (AIUM) Statement on Mammalian In Vivo Biological Effects, no independently confirmed biological effects have occurred with spatial peak, temporal average intensities below for tissues exposed in vivo?

- (1). 1 W/cm<sup>2</sup>
- (2). 1,000 mW/cm<sup>2</sup>
- (3). 500 dB
- (4). 100 mW/cm<sup>2</sup>

Q82. The possible diagnosis in this image (testes) is?



- (1). testicular cancer
- (2). hydrocele
- (3). varicocele
- (4). trauma

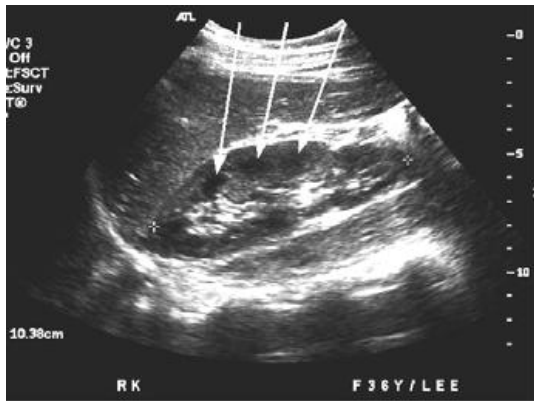
Q83. At what gestational age should fetal heart motion be detected on transvaginal sonogram?

- (1). 4 weeks
- (2). 6 weeks
- (3). 8 weeks
- (4). 10 weeks

Q84. On the transverse sonogram, the common bile duct is located \_\_\_\_\_ to the head of the pancreas and lies to the inferior vena cava.

- (1). anterior; medial
- (2). posterior; posterior
- (3). posterior; anterior
- (4). anterior; posterior

Q85. The arrow in Figure points to



- (1). renal cyst
- (2). pyramids
- (3). calyces
- (4). tumors

Q86. Obstructive jaundice may be diagnosed sonographically by demonstrating

- (1). a mass on the head of the pancreas with a dilated common bile duct
- (2). an enlarged liver
- (3). a fibrotic and shrunken liver
- (4). cholangitis

Q87. Which of the following vessels can be seen posterior to the inferior vena cava?

- (1). right renal vein
- (2). right renal artery
- (3). left renal vein
- (4). left renal artery

Q88. The most common and accepted method for measuring the biparietal diameter (BPD) is from ?

- (1). outer to outer edge
- (2). outer to inner edge
- (3). inner to inner edge
- (4). mid-echo to mid-echo edge

Q89. The minimum anterior-posterior diameter for the diagnosis of abdominal aortic aneurysm is ?

- (1). 1 cm
- (2). 2 cm
- (3). 3 cm
- (4). above 3 cm

Q90. An abscess may appear sonographically ?

- (1). echo free with well-defined borders
- (2). solid with smooth borders
- (3). a variable echo texture with irregular borders
- (4). hyperechoic with well-defined borders

Q1. Multiple frequency operation with a single probe is possible on those transducer systems that have:

- |                           |                            |
|---------------------------|----------------------------|
| (1). Very narrow elements | (2). Very thin elements    |
| (3). Very short elements  | (4). Very large bandwidths |

Q2. Axial resolution is most closely associated with :

- |                      |                          |
|----------------------|--------------------------|
| (1). Transducer size | (2). Transducer focusing |
| (3). Beam width      | (4). Pulse duration      |

Q3. As the number of cycles in the pulse increases, the axial resolution:

- (1). Improves
- (2). Stays the same
- (3). Gets worse
- (4). Either improves or get worse, depending on the frequency

Q4. Lateral resolution is most closely associated with :

- |                      |                           |
|----------------------|---------------------------|
| (1). Beam width      | (2). Spatial pulse length |
| (3). Transducer size | (4). Pulse duration       |

Q5. Approximately how much time passes between pulse transmission and echo reception from a 5 cm deep interface?

- |                 |                 |                 |                  |
|-----------------|-----------------|-----------------|------------------|
| (1). 13 $\mu$ s | (2). 65 $\mu$ s | (3). 39 $\mu$ s | (4). 130 $\mu$ s |
|-----------------|-----------------|-----------------|------------------|

Q6. What is the approximate wavelength in soft tissue with a 2 MHz ultrasound beam?

- |              |             |             |           |
|--------------|-------------|-------------|-----------|
| (1). 0.13 mm | (2). 0.8 mm | (3). 1.3 mm | (4). 8 mm |
|--------------|-------------|-------------|-----------|

Q7. Which of the following ultrasound sequences velocity in tissue, from slowest to fastest?

- |                                    |                                    |
|------------------------------------|------------------------------------|
| (1). air, fat, blood, muscle, bone | (2). fat, air, blood, muscle, bone |
| (3). blood, muscle, fat, air, bone | (4). bone, muscle, fat, blood, air |

Q8. What is the approximate wavelength range for diagnostic ultrasound?

- |             |                  |                  |                |
|-------------|------------------|------------------|----------------|
| (1). 1-5 mm | (2). 0.1-0.77 mm | (3). 0.01-0.1 mm | (4). 10-100 mm |
|-------------|------------------|------------------|----------------|



Q9. What approximate percent of 3.5 MHz ultrasound beam will be reflected from a fat ( $Z = 1.38 \text{ Mrayls}$ ) and muscle ( $Z = 1.7 \text{ Mrayls}$ ) interface?

- (1). 1%                      (2). 5%                      (3). 10%                      (4). 30%

Q10. Specular reflection occurs only:

- (1). at high frequency                      (2). at a smooth interface  
(3). at a high-impedance interface                      (4). with a focused beam

Q11. Which of the following has highest acoustic attenuation at 1 MHz?

- (1). bone                      (2). fat                      (3). kidney                      (4). lung

Q12. What is the principle of ultrasound transducer?

- (1). Doppler effect                      (2). Photoelectric effect  
(3). Compton effect                      (4). Piezoelectric effect

Q13. If a 2-cycle pulse is generated from a 5 MHz transducer with a pulse repetition frequency (PRF) of 1000 pulses per second, what is the axial resolution?

- (1). 0.1 mm                      (2). 0.3 mm                      (3). 1.1 mm                      (4). 2.2 mm

Q14. The signal processing technique of time-gain compensation (TGC) attempts to correct for \_\_\_\_ of the ultrasound beam

- (1). velocity change                      (2). attenuation  
(3). reflection                      (4). refraction

Q15. What is the most commonly used piezoelectric material in real-time imaging transducers?

- (1). Quartz                      (2). PZT  
(3). Wood                      (4). Cesium iodide

Q16.If each frame is composed of 200 lines of sight and the depth of scanning is 8 cm, what is the maximum frame rate in frame per second?

- (1). 24                                      (2). 17                                      (3). 48                                      (4). 10

Q17.Color Doppler has the potential to determine

- (1). The depth of the vessel                                      (2). The velocity of the vessel  
(3). The direction of the vessel                                      (4). All of the above

Q18.Calculate the velocity of the vessel if a Doppler shift of 1600 Hz is observed. The angle of insonation is 60 degrees. The center frequency of the transducer is 2 MHz.

- (1). 8 cm/s                                      (2). 33 cm/s                                      (3). 52 cm/s                                      (4). 123 cm/s

Q19.Which of the following improves axial resolution in the real-time image?

- (1). Increasing transducer frequency                                      (2). Using lower Q-value transducer  
(3). Shorting the pulse duration                                      (4). All of the above

Q20.Which real-time transducer is electrically steered and focuses?

- (1). Linear phased array                                      (2). Mechanical sector  
(3). Annular array                                      (4). All of the above

Q21.The matching layer between the crystal and tissue is designed primarily to

- (1). insulate the patient from the hot crystal  
(2). reduce the vibration of the transducer  
(3). reduce the acoustic impedance mismatch between crystal and tissue  
(4). protect the crystal from mechanical shock

Q22. Which of the following is mostly likely to generate the strongest echo?

- (1). Fat and soft tissue
- (2). Air and soft tissue
- (3). Bone and soft tissue
- (4). Echo strength does not depend on composition of interface

Q23. Which of the following is TRUE regarding the Doppler effect?

- (1). The Doppler shift is the difference between the transmitted frequency and the observed frequency
- (2). The magnitude of the Doppler shift does not depend on the relative velocity between the source and the receiver
- (3). The maximal Doppler shift will occur when the direction of ultrasound wave propagation is perpendicular to the motion
- (4). All of the above

Q24. If the physical size of a cyst is 2 cm in diameter, what is the depicted size in the image? Assume that the acoustic velocity in the cyst is 1000 m/s?

- (1). 1.3 cm
- (2). 2 cm
- (3). 3.1 cm
- (4). 6.2 cm

Q25. Which of the following **cannot** eliminate the aliasing artifact?

- (1). Shift baseline
- (2). Increase PRF
- (3). Increase Doppler angle
- (4). increase power setting by 3 dB

Q26. The aliasing artifact appears:

- (1). CW Doppler
- (2). M-mode
- (3). PW Doppler
- (4). compound B-mode

Q27. All of the following are biological effect of the ultrasound **except**

- (1). thermal effect
- (2). cavitations
- (3). mechanical effect
- (4). radiation effect

Q28. Which of the following cannot be found in the region of a cyst?

- (1). echo-free
- (2). acoustic shadowing
- (3). well-defined margin
- (4). acoustic enhancement

Q29. The Doppler shift produced by scanning an interface moving is usually

- (1). in the audible range
- (2). ultrasound range
- (3). infrasound range
- (4). above 3 MHz

Q30. The velocity of ultrasound in soft tissue is approximately

- (1). 330 m/s
- (2). 1540 m/ $\mu$ s
- (3). 1540 cm/s
- (4). 1.54 mm/ $\mu$ s

Q31. What causes reflection at a tissue interface?

- (1). absorption
- (2). attenuation
- (3). impedance change
- (4). velocity change

Q32. Why does an ultrasonographer apply gel to a patient's skin during imaging?

- (1). to remove air and improve transmission
- (2). to reduce patient's dose
- (3). to soften skin
- (4). to improve reflections

Q33. Beam diameter determines

- (1). lateral resolution
- (2). spatial pulse length
- (3). temporal resolution
- (4). axial resolution

Q34. Low frequency transducers have

- (1). shorter wavelength and less penetration
- (2). longer wavelength and greater penetration
- (3). shorter wavelength and greater penetration
- (4). longer wavelength and less penetration

Q35. Mirror image artifact is seen near the

- (1). rib                      (2). diaphragm                      (3). cyst                      (4). gallbladder

Q36. Which of the following is CORRECT?

- (1). Temperature is an acoustic variable  
(2). Density is not an acoustic variable  
(3). Velocity of sound in a medium changes with frequency  
(4). Ultrasound waves in soft tissue are transverse waves

Q37. Which of the following forms the basis for intermittent imaging with contrast agents?

- (1). Harmonic scattering from microbubbles  
(2). Solid  
(3). Nonlinear propagation  
(4). Stress/strain of tissue

Q38. Which of the following forms the basis for elastic imaging?

- (1). Harmonic scattering from microbubbles  
(2). Tissue-dependent attenuation  
(3). Nonlinear propagation  
(4). Stress/strain of tissue

Q39. Calculate the near-field depth for a 5 mm diameter crystal operating at 5 MHz.

- (1). 20 mm                      (2). 10 mm                      (3). 2 mm                      (4). 5 mm

Q40. According to the American Institute of Ultrasound in Medicine (AIUM) Statement on Mammalian In Vivo Biological Effects, no independently confirmed biological effects have occurred with spatial peak, temporal average intensities below for \_\_\_\_ tissues exposed in vivo.

- (1). 1 W/cm<sup>2</sup>                      (2). 1,000 mW/cm<sup>2</sup>  
(3). 500 dB                      (4). 100 mW/cm<sup>2</sup>

Q41. Which interaction between tissue and sound wave is responsible for energy conversion to heat

- (1). acoustic impedance
- (2). scattering
- (3). absorption
- (4). diffraction

Q42. When expressed in the image are called \_\_\_\_ artifact.

- (1). Mirror image
- (2). Comet tail
- (3). refraction
- (4). Ghost image

Q43. What component of the transducer is designed to enhance transmission of sound energy into the patients?

- (1). backing material
- (2). electric insulator
- (3). matching layer
- (4). RF shielding

Q44. Which has a higher acoustic impedance?

- (1). bone
- (2). soft tissue
- (3). water
- (4). air

Q45. Velocity time density equals

- (1). intensity
- (2). duty factor
- (3). quality factor
- (4). impedance

Q46. Which of the following is an example of an acoustic window?

- (1). bladder
- (2). blood
- (3). bone
- (4). rib

Q47. If the center frequency of a broadband transducer is changed from 2 MHz to 5 MHz, what is the effect on acoustic velocity in tissue?

- (1). increased
- (2). decreased
- (3). remain unchanged
- (4). none of the above

Q48. Which of the following represents depth vs. time scan

- (1). A mode
- (2). B mode
- (3). C mode
- (4). M mode

Q49. What is the artifact of this image



- (1). acoustic enhancement
- (2). ghost image
- (3). mirror image
- (4). reverberation artifact

Q50. What is the artifact of this image



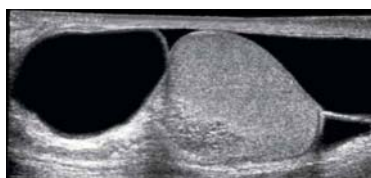
- (1). reverberation artifact
- (2). grating lobe; side lobe
- (3). ghost image
- (4). acoustic enhancement

Q51. The possible diagnosis in this image is



- (1). polyp                      (2). gallstone                      (3). cholecystitis                      (4). carcinoma

Q52. The possible diagnosis in this image (testes) is



- (1). testicular cancer                      (2). hydrocele  
(3). varicocele                      (4). trauma

Q53. The possible diagnosis in this abdominal image is



- (1). hydronephrosis                      (2). ascites  
(3). RCC                      (4). renal stone

Q54. Which of the following is hyperechoic?

- (1). renal sinus                      (2). renal vein                      (3). pancreas                      (4). gallbladder

Q55. Which of the following is typical sign for carcinoma in GI

- (1). target sign                      (2). hump sign  
(3). pseudokidney sign                      (4). star sign



Q56. Which of the following is **INCORRECT**?

- (1). Liver is homogeneous echo pattern
- (2). Fatty liver is hypoechoic
- (3). Portal vein is monophasic
- (4). Normal hepatic artery is low RI

Q57. The portal triad except

- (1). portal vein
- (2). hepatic vein
- (3). hepatic artery
- (4). CBD

Q58. Nonmobile internal echoes without shadowing in gallbladder could be

- (1). gallstone
- (2). blood clot
- (3). gallbladder sludge
- (4). polyp

Q59. Which of the following is a landmark during scanning pancreas?

- (1). splenic hilus
- (2). SMA
- (3). gallbladder
- (4). hepatic vein

Q60. Which of the following is hyperechoic during scanning pancreas?

- (1). acute pancreatitis
- (2). adenocarcinoma
- (3). pseudocyst
- (4). chronic pancreatitis

Q61. Stress echocardiography

- (1). is used instead of standard stress testing
- (2). studies the acoustic properties of the myocardium
- (3). allows for visualization of myocardial perfusion
- (4). is used in diagnosing ischemic heart disease

Q62. Compare the echogenicities of the following structures and place them in decreasing echogenic order.

- (1). renal sinus > pancreas > liver > spleen > renal parenchyma
- (2). renal sinus > liver > spleen > pancreas > renal parenchyma
- (3). pancreas > liver > spleen > renal sinus > renal parenchyma
- (4). renal parenchyma > spleen > liver > pancreas > renal sinus

Q63. The sonographic texture of the normal testis is

- (1). heterogeneous with high-intensity echoes
- (2). homogeneous with low-level echo
- (3). homogeneous with medium-level echogenicity
- (4). variable echo pattern

Q64. The “halo” sign as it pertains to thyroid masses is defined as a rim of sonolucency surrounding an intrathyroidal mass. It is most commonly encountered in

- (1). cyst
- (2). adenoma
- (3). carcinoma
- (4). thyroiditis

Q65. A 3-year-old boy presents with hematuria and a palpable left flank mass. This finding would *most* likely represent

- (1). hypernephroma
- (2). Wilm’s tumor
- (3). neuroblastoma
- (4). polycystic kidney disease

Q66. The renal pyramids are found in the

- (1). cortex
- (2). medulla
- (3). renal sinus
- (4). renal pelvis

Q67. The arrow in Figure points to



- (1). LHv
- (2). IVC
- (3). RHv
- (4). Pv

Q68. The arrow in Figure points to



- (1). extrabiliary duct
- (2). intrabiliary duct
- (3). hepatic vein
- (4). Pv

Q69. This figure is a transverse scan through the bladder. The most likely diagnosis in the patients is



- (1). BPH
- (2). prostatitis
- (3). prostatic cancer
- (4). calcification

Q70. At what gestational age should fetal heart motion be detected on transvaginal sonogram?

- (1). 4 weeks
- (2). 6 weeks
- (3). 8 weeks
- (4). 10 weeks

Q71. The range of transducer frequencies used in transvaginal sonography

- (1). 3.5 to 5.0 MHz
- (2). 5.0 to 7.5 MHz
- (3). 2.5 to 3.5 MHz
- (4). 12 MHz

Q72. The crown-rump length, (CRL) should be performed between which weeks of gestation?

- (1). 5-8
- (2). 7-11
- (3). 9-14
- (4). 12-18

Q73. In acute deep vein thrombosis (DVT), proximal to the level of obstruction, the Doppler flow will be

- (1). increase
- (2). decrease
- (3). absent
- (4). continuous and unaffected by respiration

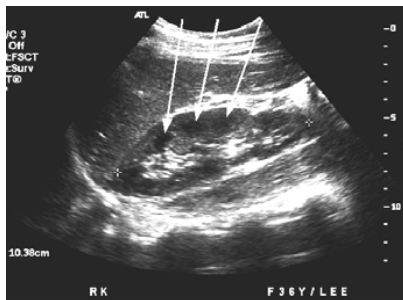
Q74. On the transverse sonogram, the common bile duct is located \_\_\_\_ to the head of the pancreas and lies \_\_\_\_ to the inferior vena cava.

- (1). anterior; medial
- (2). posterior; posterior
- (3). posterior; anterior
- (4). anterior; posterior

Q75. Diffuse thickening of the gallbladder wall can be seen with all of the following *except*

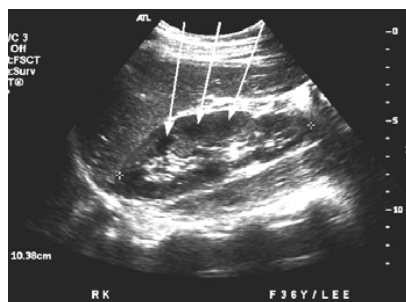
- (1). acute cholecystitis
- (2). hepatitis
- (3). congestive heart failure
- (4). elevated portal pressure

Q76. A 11-month-old infant scans right upper abdominal. This transverse sonogram would *most* likely diagnosis in



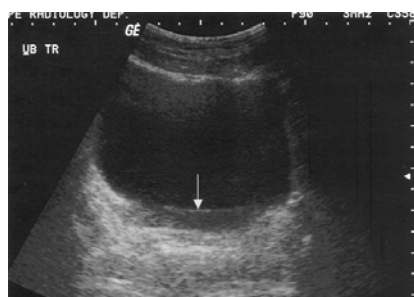
- (1). stomach cancer
- (2). intussusception
- (3). lymphoma in colon
- (4). appendicitis

Q77. The arrow in Figure points to



- (1). renal cyst
- (2). pyramids
- (3). calyces
- (4). tumors

Q78. The arrow in Figure indicates



- (1). reverberation artifact
- (2). ghost image
- (3). section thickness artifact
- (4). acoustic enhancement

Q79. Which landmark is most associated with the pancreatic head?

- (1). hepatic artery
- (2). superior mesenteric artery
- (3). porta hepatic
- (4). superior mesenteric vein

Q80. Obstructive jaundice may be diagnosed sonographically by demonstrating

- (1). a mass on the head of the pancreas with a dilated common bile duct
- (2). an enlarged liver
- (3). a fibrotic and shrunken liver
- (4). cholangitis

Q81. Which of the following vessels can be seen posterior to the inferior vena cava?

- (1). right renal vein
- (2). right renal artery
- (3). left renal vein
- (4). left renal artery

Q82. Fatty liver in sonogram except

- (1). diffuse bright liver
- (2). hypoechoic in liver
- (3). hepatomegaly
- (4). low level echo of portal vein wall

Q83. Which of the following is not acoustic window during transcranial Doppler (TCD) scan

- (1). transtemporal
- (2). transoccipital
- (3). transnasal
- (4). transorbital

Q84. The most common and accepted method for measuring the biparietal diameter (BPD) is from

- (1). outer to outer edge
- (2). outer to inner edge
- (3). inner to inner edge
- (4). mid-echo to mid-echo edge

Q85. Carotid bruit is heard because of

- (1). arteriovenous malformation
- (2). disease of the great vessels
- (3). audible turbulence localized at the carotid bifurcation
- (4). valvular stenosis

Q86. An increased resistivity index (RI) in the common carotid artery may indicate

- (1). stenotic disease proximal to the sample size
- (2). stenotic disease distal to the sample size
- (3). disease at the sample site
- (4). sample volume placement too close to the arterial wall

Q87. The minimum anterior-posterior diameter for the diagnosis of abdominal aortic aneurysm is

- (1). 1 cm
- (2). 2 cm
- (3). 3 cm
- (4). above 3 cm

Q88. Nonshadowing, nonmobile, echogenic foci seen within the gallbladder are most likely

- (1). polyps
- (2). calculi
- (3). carcinoma
- (4). sludge balls

Q89. Enlarged lymph nodes will usually appear sonographically as a

- (1). heterogeneous mass with poor through transmission
- (2). homogeneous mass with poor through transmission
- (3). heterogeneous mass with excellent through transmission
- (4). none of the above

Q90. An abscess may appear sonographically

- (1). echo free with well-defined borders
- (2). solid with smooth borders
- (3). a variable echo texture with irregular borders
- (4). hyperechoic with well-defined borders

# US

1. Which of the following is true about characteristics of sound-wave?

- (1) Mechanical, transverse
- (2) Mechanical, longitudinal
- (3) Non-mechanical, longitudinal
- (4) Longitudinal, transverse

2. Which of the following is true about characteristics of ultrasound?

- (1) Air faster than liquid
- (2) Liquid attenuated bigger than air
- (3) Sound wave is transmitted of the bone and has lower attenuation
- (4) When the frequency is higher, transmit depth is lower.

3. Which of the following has the highest speed of sound?

- (1) Air
- (2) Muscle
- (3) Liquid
- (4) Bone

4. Unit for intensity in the field of an ultrasound transducer is?

- (1) Watts
- (2) dB
- (3) lb/cm<sup>2</sup>
- (4) Watts/cm<sup>2</sup>

5. Which of the following is the ratio of pulse duration and the period?

- (1) Duty factor
- (2) Spatial pulse length
- (3) Pulse repetition period
- (4) Pulse repetition frequency

6. Which of the following is NOT a feature artifact?

- (1) Comet tail
- (2) Edge shadowing
- (3) Ring down
- (4) Mirror image

7. Which of the following below has the lowest attenuation coefficient?

- (1) Lung
- (2) Water
- (3) Liver
- (4) Fat

8. Which of the following is true about matching layer?

- (1) Located crystal posterior region
- (2) Normal thickness in wavelength 1/4
- (3) During the increasing thickness and then sensitive is more decrease.
- (4) During the increasing thickness and then axial resolution is decrease



9. If the patient has GB stone, what can be used the physical phenomenon about diagnostic results?

- (1) Acoustic enhancement
- (2) Acoustic shadowing
- (3) Reverberation
- (4) Ring-down

10. Which of the following is the reason for edge shadowing the cyst?

- (1) Absorption
- (2) Scattering
- (3) Refraction
- (4) Reflection

11. Which of the following is NOT true about the method that makes NEAR FIELD longer?

- (1) Increase the diameter
- (2) Shorten the cycle
- (3) Enhance the frequency
- (4) Focus the sound

12. What is the purpose of focusing the sound for?

- (1) For better the axial resolution
- (2) For longer the near field.
- (3) For bigger the beam divergence
- (4) For better the lateral resolution

13. Which of the following is true about the DR (dynamic range)?

- (1) Controls the echo texture according to the depth.
- (2) Decides extend of echo texture according to the displaying monitor.
- (3) Adjusts the overall echo intensity.
- (4) Controls focal legion by the sweeping.

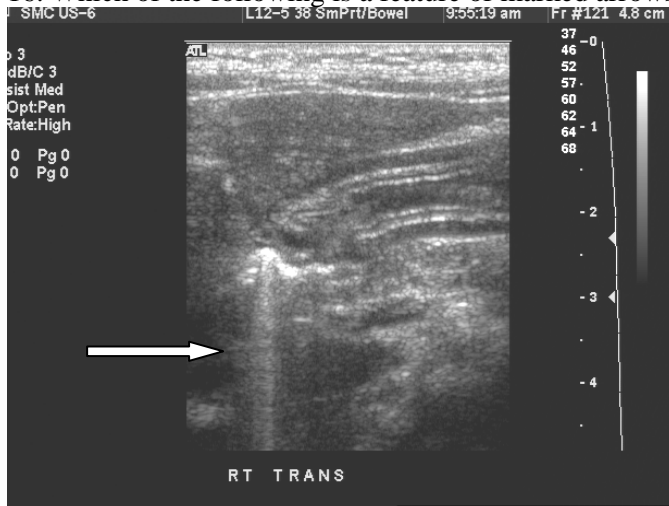
14. Which of the angle is NOT producing Doppler shift?

- (1)  $0^\circ$
- (2)  $45^\circ$
- (3)  $60^\circ$
- (4)  $90^\circ$

15. Which of the following producing artifacts is made from diaphragm echo?

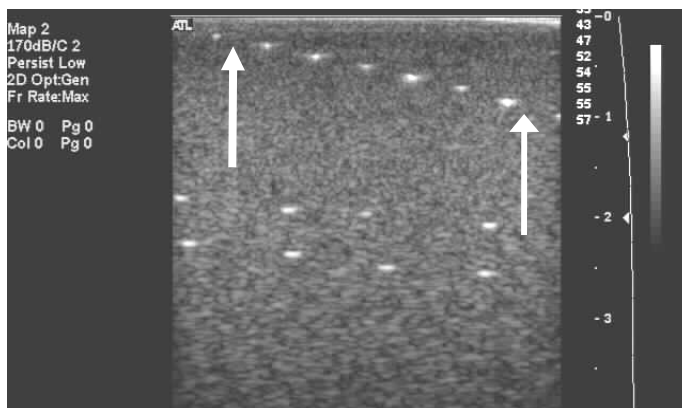
- (1) Side lobe artifacts
- (2) Posterior acoustic shadowing
- (3) Reverberation
- (4) Mirror effects

16. Which of the following is a feature of marked arrows?



- (1) Ring down
- (2) Reverberation
- (3) Side lobe
- (4) Comet tail

17. This is the evaluation of performance in ultrasound equipment. What are the arrows indicated for?



- (1) Axial resolution
- (2) Lateral resolution
- (3) Focal zone resolution
- (4) Dead zone resolution

18. Which of the following is for the region without reflection echo?

- (1) Echogenic
- (2) Echo-free
- (3) Hyperechoic
- (4) Isoechoic

19. Which of the following is NOT related with the kidney image?



- (1)Hydronephrosis
- (2) Posterior shadowing (3) Caused by hematuria(4)Chronic renal disease

20. Which of the following is NOT true about liver cirrhosis?

- (1) Ascites
- (2) Bleed of vein
- (3) Coma of liver
- (4) Dysuria

21 Which of the following is NOT associated with sonographic findings in liver cirrhosis?

- (1) Contour irregularities
- (2) Increase of echogenicity
- (3) Increase of the number of vessels visualized
- (4) High attenuation

22. Which of the following is a disease of pediatric liver?

- (1) Hepatoblastoma
- (2) Metastatic disease
- (3) Polycystic liver and kidney disease
- (4) Hepatic fibrosis

23. Which of the following is NOT true the difficulty diagnostic of choledocholithiasis ?

- (1) GB collapse
- (2) Non shadowing stone
- (3) Floating stone
- (4) Stone is located in body dependent portion

24. Which of the following is correct the explanation about the indicated arrow?



- (1) This is located in almost the same axis level of middle hepatic vein.
- (2) This is the landmark to classify the right and the left lobe.
- (3) This is coincided with Cantle's line which is connecting with gallbladder and IVC.
- (4) This is located in the upper area of left lobe.

25. What is the indicated arrow?

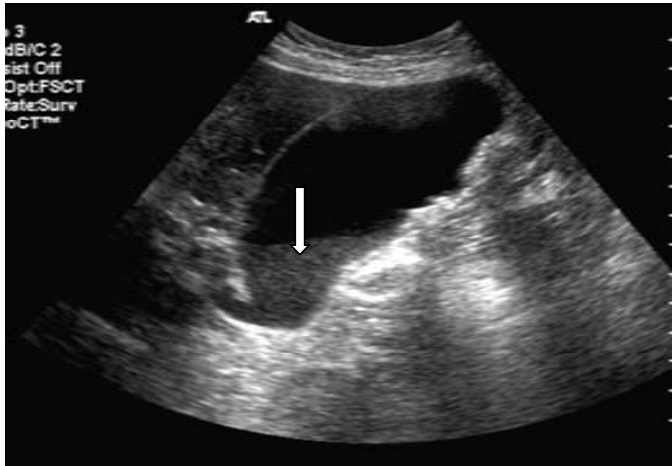


- (1) Common bile duct
- (2) Umbilical portion
- (3) Hepatic vein
- (4) Porta hepatis

26. Which of the following is NOT the reason for GB wall thickening?

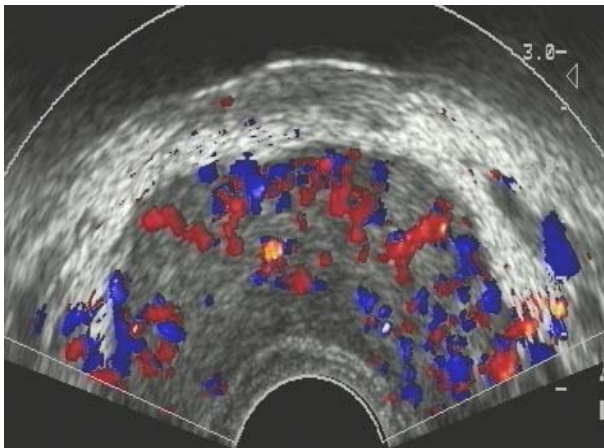
- (1) Contraction of normal GB
- (2) Inadequate TGC and Gain
- (3) Adenomyomatosis
- (4) Ascites

27. What is the indicated arrow?



- (1) It is sandy stone and is changed depends on the position
- (2) It depends on exam direction changed the fundus artifact
- (3) Sludge bile makes the parallel to fundus level by the changed position.
- (4) GB Carcinoma's position is not changed.

28. The sonographic finding of prostatitis can NOT be seen?



- (1) Can observe the moderate enlargement with poor margination.
- (2) Prostatic Cancer can be diagnosed if the asymmetric gland shape and echo-poor mass pattern are shown
- (3) Prostatic malignancy is similar with echo-texture
- (4) Increased blood pattern can be seen by color Doppler examination

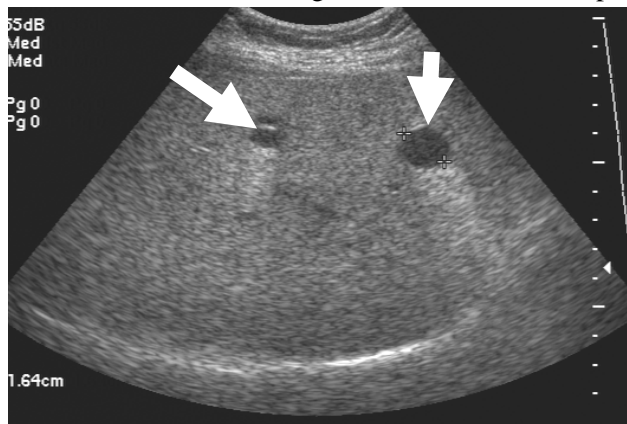
29. Which of the followings are the reasons for reasplenic infarction EXCEPT.

- (1) Splenomegaly
- (2) Thrombose
- (3) Pancreatitis
- (4) Leukemia

30. There are 3 branches of the celiac axis EXCEPT.

- (1) Common hepatic artery
- (2) Lt. gastric artery
- (3) Splenic artery
- (4) Superior mesenteric artery

31. Which of the following is NOT true about the pointed arrows?



- (1) Internal material is fluid.
- (2) Observed Posterior enhancement
- (3) Diagnosed as hemangioma
- (4) Has Oval shape and benign tumor

32. Where is proper position for measuring the BPD?

- (1) Outer to outer edge
- (2) Outer to inner edge
- (3) Inner to inner edge
- (4) Outer to mid edge

33. What ascites is caused by the shortage of?

- (1) Albumin
- (2) Fibrinogen
- (3) Heparin
- (4) Prothrombin

34. When the scanning the Abdominal transverse, where is the best position for observing Left Renal Vein?

- (1) In front of IVC
- (2) Behind the Aorta area
- (3) Between the SMA and Aorta
- (4) Between the IMA and IVC

35. The followings are consisted of collecting systems EXCEPT

- (1) Ureter
- (2) Renal pelvis
- (3) Minor calyces
- (4) Major calyces

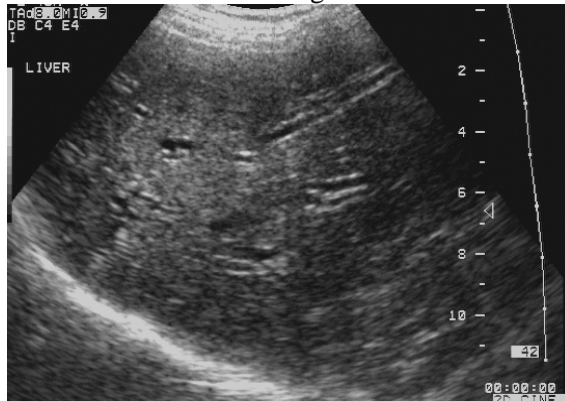
36. What is the same meaning with echolucent?

- (1) Sonolucent, echogenic
- (2) Hyperechoic, echogenic
- (3) Anechoic, hyperechoic
- (4) Anechoic, sonolucent

37. What is the tumor marker for diagnosing the prostate cancer?

- (1) AFP
- (2) PSA
- (3) HCG
- (4) ALP

38. Which of the following is NOT true about below image?

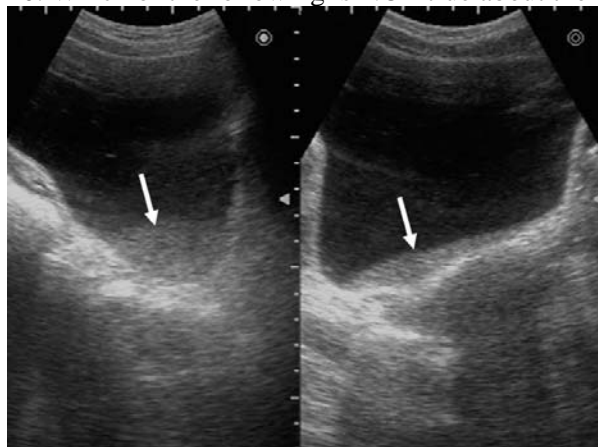


- (1) Parallel channel sign
- (2) Dilated in intra hepatic duct
- (3) Abnormal gallbladder
- (4) Elevated bilirubin

39. Which of the following is NOT true about the nephritis ?

- (1) Acute - fever, back pain, cystitis
- (2) In chronic - acute has same symptoms
- (3) 80% acute is E-coli.
- (4) Ureter obstruction, ureter stone, ureter tumor, pregnancy

40. Which of the following is NOT true about the bladder image below?



- (1) After surgery.
- (2) Hemorrhagic of cystitis
- (3) Position change required
- (4) High frequency transducer

41. In sonographic diagnostic, Which one of the following is for acute hepatitis EXCEPT.

- (1) Enlarge of liver
- (2) Increased of parenchymal echo texture
- (3) Portal vein branch brighter is seen
- (4) Gallbladder wall thickening

42. Which one following below is the nearest strap muscle from the THYROID lateral lobe?

- (1) Sternohyoid
- (2) Sternothyroid
- (3) Omohyoid
- (4) Anterior scalene

43. Which one is not the symptom about the shortage of thyroxine?

- (1) Nervousness
- (2) Weight loss
- (3) Hypertension
- (4) Bradycardia

44. Which of the following is related with spermatic cord EXCEPT.

- (1) Testicular artery
- (2) Ductus deferens
- (3) Mediastinum testes
- (4) Pampiniform plexus veins

45. Which of the following is NOT accompanied with ascites?

- (1) Liver cirrhosis
- (2) Congestive heart failure
- (3) Nephritic syndrome
- (4) Adenomyomatosis

46. What is the sonographic finding below?



- (1) Adenoma
- (2) Abscess
- (3) Calcification
- (4) Fatty liver



47. Which one of the following is NOT true?

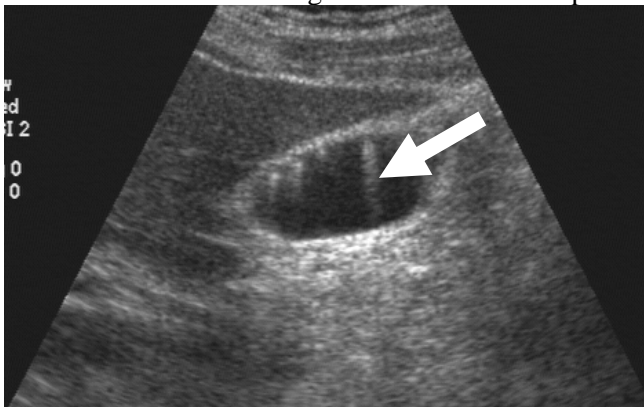


- (1) Porta hepatis
- (2) Liver echo texture is homogeneous.
- (3) Not seen hepatic artery
- (4) Middle hepatic vein.

48. After taking meal, this enable bile juice to letout to the duodenum. What is this ?

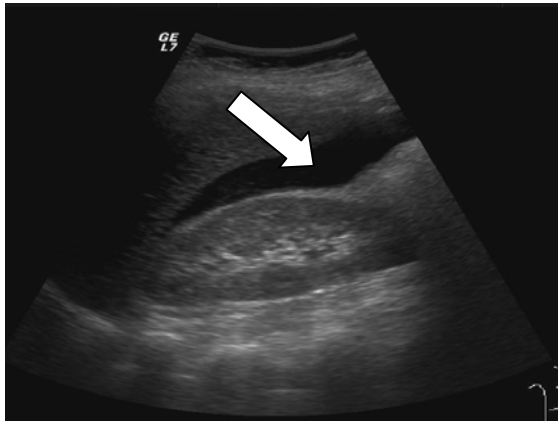
- (1) Glycogen
- (2) Insulin
- (3) Carboxypeptide
- (4) Cholecystokinin

49. Which of the following is NOT related with pointed GB IMAGE?



- (1) Rokitansky Aschoff sinuses
- (2) Adenomyomatosis
- (3) Obstruction
- (4) Ring down artifact

50. Identify the anatomical structure labeled arrow



- (1) Cul-de-sac
- (2) Morison's pouch
- (3) Douglas pouch
- (4) Lesser sac

51. Where is "spiral valve of Heister" located ?

- (1) Common bile duct
- (2) Cystic duct
- (3) Gallbladder
- (4) Common hepatic duct

52. Which of the following is NOT true about chronic cholecystitis?

- (1) Porcelain GB
- (2) Adenomyomatosis
- (3) Emphysematous cholecystitis
- (4) GB cancer

53. Which one of the following is correct about gallbladder polyp ?

- (1) This is a kind of malignant tumor
- (2) This is attached GB wall.
- (3) It has posterior acoustic shadow
- (4) Diameter is more than 1cm, it is mono type

54. What's the landmark of gallbladder when it is not visualized gallbladder?

- (1) Superior mesenteric artery
- (2) Common hepatic duct
- (3) Ligamentum venosum
- (4) Main lobar fissure

55. Which of the following is NOT correct about image?



- (1) Visualized reverberation artifact
- (2) Longitudinal image
- (3) Porcelain GB image
- (4) Visualized junctional fold by GB

56. Which of the following is NOT correct about image?



- (1) Cause of portal vein
- (2) Pancreas head cancer
- (3) Abnormal intrahepatic duct
- (4) Ampullar of Vater's cancer

57. Which of the following is true image?



- (1) Liver is role of acoustic window .
- (2) Pancreas function
- (3) Double bleb sign
- (4) Low frequency probe

58. Which of the following is NOT true about the finding of cavernous hemangioma sonographic?

- (1) Always seen as echogenic
- (2) Distinguished a hepatoma
- (3) Well defined the tumor and internal was seen as anechoic.
- (4) Seen as a single or multiple lesions

59. Which one of the following is true about Budd-Chiari syndrome?

- (1) Cause of obstruction portal venous flow
- (2) Cause of obstruction hepatic venous flow
- (3) Always obstruction IVC
- (4) Shrunken of the liver

60. Which one of the following is NOT true about OB/GYN examination?

- (1) Yolk sac can be seen at 1'st trimester
- (2) Can find the fetal age by measuring CRL, BPD, FL.
- (3) Fetus has lung breathing during the prenatal period.
- (4) Two umbilical veins are seen normally.

61. Which of the following is NOT true about kidney anatomy?

- (1) Kidney consists of sinus and cortex
- (2) Cortex includes nephron- the kidney's functional unit.
- (3) Urine excretes in order to minor renal calyx-major renal calyx-pelvis of kidney
- (4) Renal sinus consists of blood vessel, fat, lymph, vessel and collecting system

62. Pancreatic pseudo cyst is occurred from intra and extra pancreas each. What's the most likely occurred location in the extra pancreatic

- (1) Porta hepatic
- (2) Mediastinum
- (3) Greater sac
- (4) Lesser sac of anterior pararenal space

63. what splenic variation can be seen after splenectomy?

- (1) Accessory spleen
- (2) Born-again spleen
- (3) Wandering spleen
- (4) Upside-down spleen

64. Which of the following is most commonly occurred for 1years to 3 years Solid tumor?

- (1) Hepatoblastoma
- (2) Wilm's tumor
- (3) Renal cell carcinoma
- (4) Transitional cell carcinoma

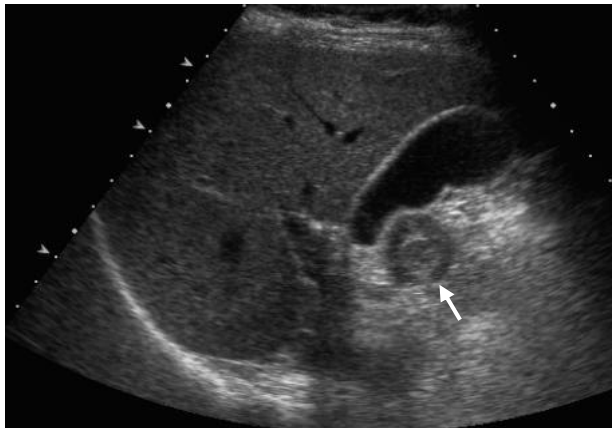
65. Which of the following is the reason for compression abdominal wall at pancreatic ultrasonography?

- (1) Pancreatic anterior to posterior width is seen
- (2) Reduce of ultrasound beam scattering
- (3) For the observation splenic vein
- (4) Move the air in the gastric tract and observe the pancreas more closely.

66. Which of the following is NOT true about uterine adenomyosis?

- (1) Endometrial tissue in the myometrium
- (2) Commonly occurred at pubertal stage
- (3) Most commonly, anterior wall is thinner than posterior wall
- (4) Seen as diffuse or focal type

67. The following is Rt. subcostal scan image, What the Arrow is pointed?

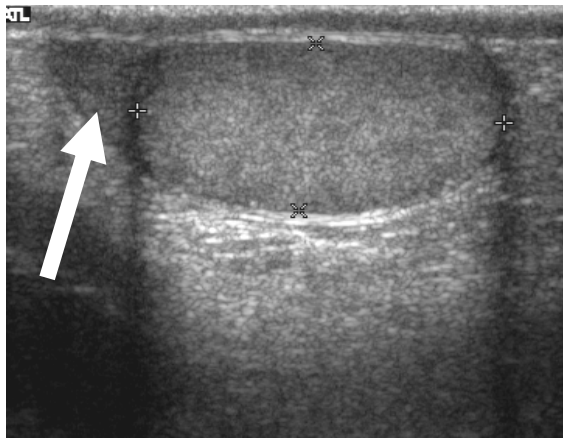


- (1) Pancreas head
- (2) Esophagus
- (3) Duodenum
- (4) Dilatation of CBD

68. Which of the following is NOT correct about malignant bladder tumor?

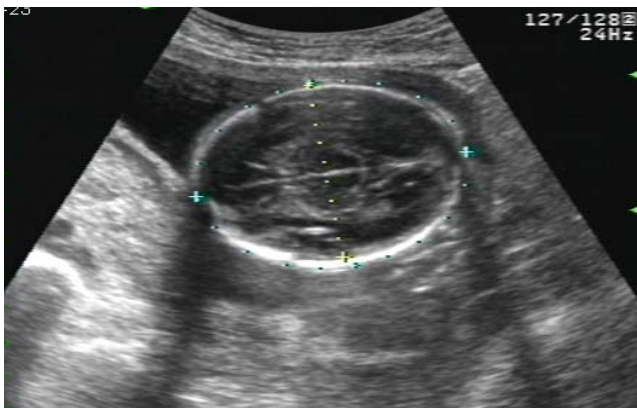
- (1) Most of malignant bladder tumor is squamous cell carcinoma
- (2) Most of symptoms are painless hematuria
- (3) It is required to take a cystoscopy and biopsy for the exact diagnose
- (4) It is required to changing position for diagnosing whether the mass seen is the blood clot or not.

69. Identify the anatomical structure that is pointed arrow



- (1) Seminoma
- (2) Mediastinum
- (3) Testis
- (4) Epididymis

70. Which of the following is NOT true about image?

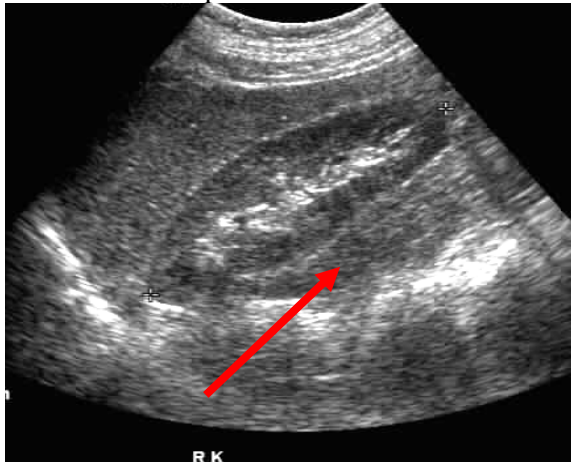


- (1) BPD, OFD, HC measurement image
- (2) Transthalamic plane image
- (3) Can be Known the fetal age
- (4) Transabdominal image

71. Which of the following is NOT true about the abdominal Aorta?

- (1) Flows to the inferior and heading to the posterior of the body
- (2) Vessel diameter becomes narrow toward the inferior.
- (3) The origin of the Abdominal vessel is celiac axis
- (4) Tunica media is thicker than IVC wall.

72. The arrow is pointed for?



- (1) Ascending colon
- (2) Right ureter
- (3) IVC
- (4) Quadratus lumborum muscle

73. Which of the following is true about normal follicles growing stages?

- (1) Follicle – Corpus luteum – Corpus albicans
- (2) Corpus luteum – Follicle – Corpus albicans
- (3) Follicle – Corpus albicans – Corpus luteum
- (4) Corpus albicans – Follicle – Corpus luteum

74. Which of the following is NOT correct about this image?



- (1) acquired by radial transducer.
- (2) Must use latex cover to prevent the inflammation
- (3) For confirming cancer invasion
- (4) A kind of electronic linear transducer

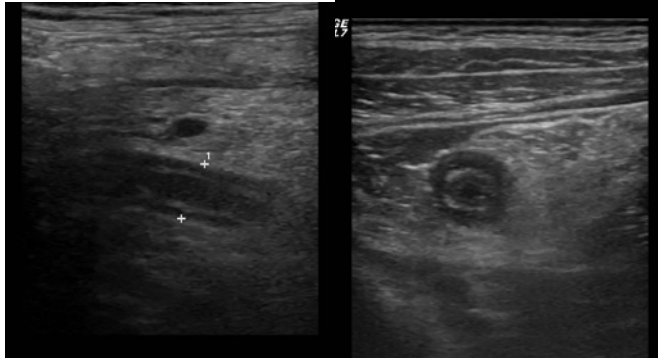
75. Which of the following is NOT correct about simple cyst?

- (1) Round or ovoid type
- (2) Well-defined wall
- (3) Anechoic, echo-free
- (4) Posterior sonic attenuation

76. Which of the following is NOT correct about transducer for infants?

- (1) The various ranges of transducers is required depends on body shape.
- (2) Generally, 5MHz transducer is used at first
- (3) Low MHz transducer is used for new-born
- (4) 3.5MHz transducer is used for obesity infant

77. Which is the most related with disease?



- (1) Appendicitis
- (2) Ileus image
- (3) Colitis image
- (4) Diverticulitis image

78. Which one of the following is commonly occurred Pancreatic malignant mass & ultrasound finding?

- (1) Islet cell tumor, hypoechoic
- (2) Mucinous cystadenoma, hyperechoic
- (3) Adenocarcinoma, hyperechoic
- (4) Adenocarcinoma, hypoechoic

79. At the Normal patient's Doppler waveform, which of the following below is NOT affected by respiration?

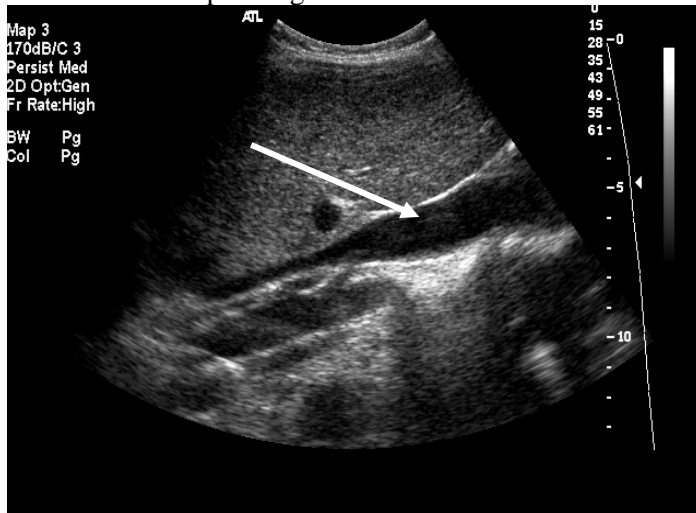
- (1) Hepatic vein
- (2) Portal vein
- (3) Carotid artery
- (4) IVC

80. Which of the hydronephrosis is NOT considered as external factor?

- (1) Renal stone
- (2) Uterine fibroid
- (3) Pregnancy
- (4) Ovarian neoplasm



81. The arrow is pointing to?



- (1) Aorta
- (2) Inferior vena cava
- (3) Left hepatic vein
- (4) Main portal vein

82. Which of the following is associated animal with echinococcus granulosus?

- (1) Pig
- (2) Cow
- (3) Dog
- (4) Cat

83. Arrow is pointing to?



- (1) Spleen
- (2) Lt. adrenal gland
- (3) Kidney
- (4) Retroperitoneum

84. Which of the following is NOT true about peri-pancreas anatomy?

- (1) Pancreas head is located anterior of IVC
- (2) CBD is located postero-lateral portion of Pancreas head
- (3) SMA & SMV is located posterior of Pancreas neck
- (4) Pancreas head is located on the lateral side of Duodenum 2<sup>nd</sup> portion

85. Which of the following is NOT true about pitfall of suspicious aortic aneurysm?

- (1) Severely Skinny patient
- (2) Serious scoliosis or kyphosis patient
- (3) Abdominal fat of obese patient
- (4) Horseshoe Kidney patient

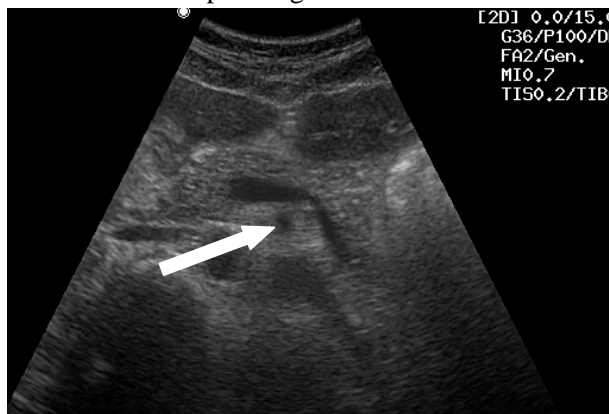
86. Which of the following is NOT associated with acute scrotitis?

- (1) Testis torsion
- (2) Epididymitis
- (3) Testis infarct
- (4) Varicocele

87. Which of the following is not associated with retroperitoneal organ?

- (1) Kidney
- (2) Pancreas
- (3) Liver
- (4) Prostate

88. The arrow is pointing to?



- (1) Aorta
- (2) SMA
- (3) SMV
- (4) IVC

89. What is the limitation splenomegaly?

- (1) 8cm
- (2) 10cm
- (3) 12cm
- (4) 14cm

90. Which of the following is not true the reason for formation of the thrombosis?

- (1) Slow flow
- (2) Decrease of RBC
- (3) Vessel wall damage
- (4) lower production of Heparin

Q1. Which one is not correct answer about characteristics of portal vein and hepatic vein?

- 1) the portal vein wall is with echo but the hepatic vein is not.
- 2) the hepatic vein`s diameter becomes thick and the portal vein becomes smaller.
- 3) the hepatic vein runs straightly but the portal vein makes curve or run tortuously.
- 4) the function of hepatic vein and portal vein is blood delivers of liver.

Q2. Which one is the representative cancer marker relevant to the hepatoma?

- 1) PSA
- 2) CA-125
- 3)  $\alpha$ -fetoprotein(AFP)
- 4) CEA

Q3. Which of the following is not correct answer about the bottom image?



- 1) the formation of regenerative node.
- 2) the existence of ascites.
- 3) the enlargement of Liver right lobe.
- 4) coarse hepatic parenchyma.

Q4. Which of the following is unrelated with echo enhancement of hepatic parenchyma?

- 1) alcohol abuse.
- 2) diabetes.

- 3) the patient who is getting chemotherapy.
- 4) acute hepatitis.

Q5. Which disease can be diagnosed by the bottom image?



- 1) klaskin's tumor
- 2) cholangitis
- 3) adenomyomatosis
- 4) biliary cytstadenoma

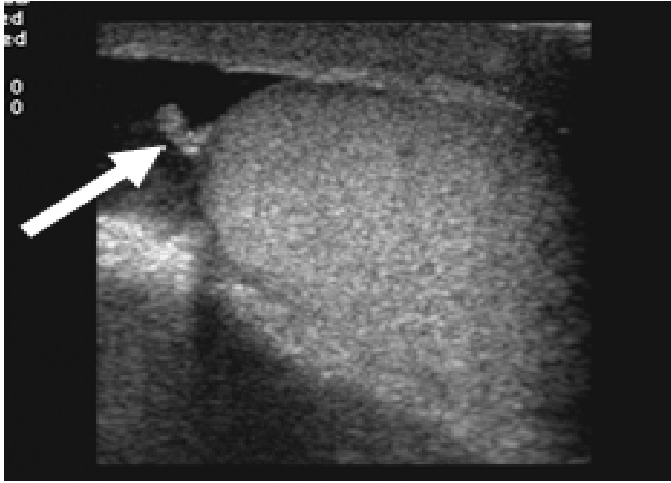
Q6. The pseudocyst of pancreas appears at 50% each extra and intra pancreas so where is the location that the most of it is appeared?

- 1) porta heptis.
- 2) the lesser sac of anterior pararenal space.
- 3) the greater sac.
- 4) mediastinum.

Q7. Which one is relevant to the pancreatic abscess?

- 1) leukocytosis.
- 2) serum amylase.
- 3) hematocrit.
- 4) hyperglycemia.

Q8. What is the anatomical name of arrow pointing?



- 1) ductus deferens.
- 2) dartos fascia.
- 3) appendix testis.
- 4) tunica albuginea.

Q9. Which blood vessel doesn't have venous valve?

- 1) external iliac vein
- 2) inferior vena cava
- 3) basilic vein
- 4) saphenous vein

Q10. Which of the following is abnormal diagnose for simple abdomen?

- 1) Aorta is located on the left from the midline.
- 2) The vena cava is located on the right side from the midline.
- 3) Both spermatic veins run into the vena cava.
- 4) Both spermatic veins are deviated from the aorta.

Q11. Which one is unrelated answer of fluid collection with the patient who got a kidney transplantation?

- 1) urinoma
- 2) lymphocele
- 3) hematoma
- 4) cystadenoma

Q12. Which of the following disease is relevant to the autoimmunity in thyroid?

- 1) Hashimoto's thyroiditis.

- 2) follicular carcinoma
- 3) lymphoma
- 4) colloid cyst

Q13. Which one is the solid tumor that usually appears at 1-3 years old infant?

- 1) hepatoblastoma
- 2) Wilms tumor
- 3) renal cell carcinoma
- 4) transitional cell carcinoma

Q14. What is the anatomical name that prostate cancer mainly occurs?

- 1) peripheral zone.
- 2) anterior fibromuscular stroma.
- 3) transitional zone.
- 4) central zone.

Q15. Which one is not relevant to the acute disease of prostate.

- 1) testical torsion.
- 2) epididymitis.
- 3) testis infarct.
- 4) varicocele.

Q16. Which one is wrong answer about the Goldberg's aorta diameter measuring?

- 1) Incoming part that passes the diaphragm and enters inside abdominal cavity is about 23mm.
- 2) It is about 20mm around the renal artery.
- 3) It is about 18mm from the bottom of renal artery.
- 4) It is about 20mm in the area of ischial artery bifurcation.

Q17. What is the reason of intrahepatic portal hypertension?

- 1) liver cirrhosis
- 2) mild fatty liver
- 3) cholangitis
- 4) acute hepatitis

Q18. Which one is wrong answer of the probe that is using for infant?

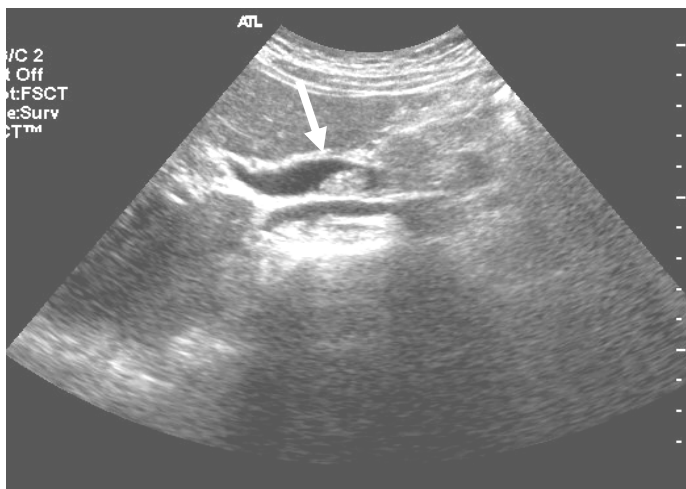
- 1) It needs diverse range probe at various infant's shape of body.
- 2) Usually 5MHz probe is using.

- 3) The low frequency probe is using for newborn baby (infant).
- 4) 3.5MHz or 2.5MHz probe is using for obese child.

Q19. Which one is the normal common bile duct diameter size of infant?

- 1) 2mm
- 2) 4mm
- 3) 5mm
- 4) 7mm

Q20. What is the arrow pointing at the bottom of the image?



- 1) This image is made by longitudinal scan and there is a gallstone in the gallbladder.
- 2) There is a thrombosis inside the main portal vein.
- 3) There is a gall stone in the intrapancreatic portion of CBD.
- 4) There is a gall stone in the suprapancreatic portion of CBD.

Q21. What is the arrow pointing at the bottom of image?





- 1) This structure would be the standard of separating left and right lobe of liver.
- 2) This structure forms a boundary between caudate lobe and medial segment of left lobe.
- 3) This structure forms a boundary between caudate lobe and lateral segment of left lobe.
- 4) This structure forms a boundary between anterior segment and posterior segment of right lobe.

Q22. Which of the following is not seen in this hepatic hilum image?

- 1) common bile duct.
- 2) portal vein.
- 3) hepatic artery.
- 4) intrahepatic bile duct.

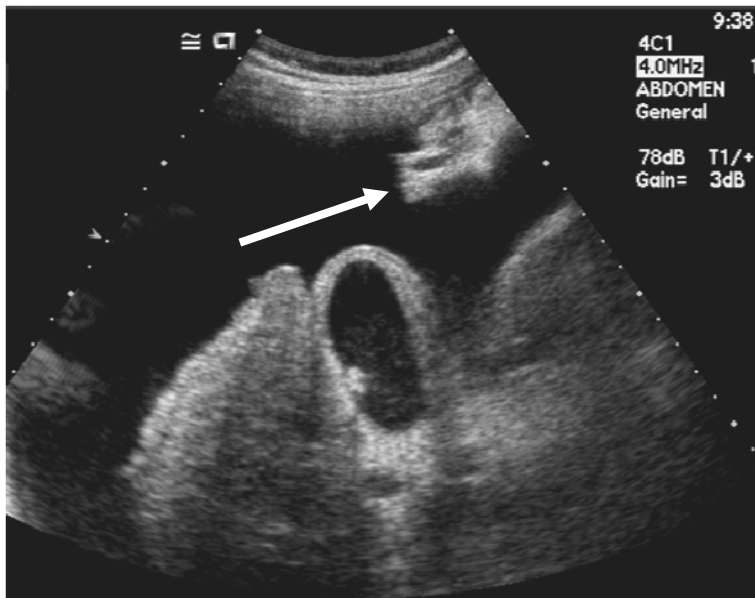
Q23. The arrow is pointing at the ultrasonic clinical sign that let us know about intrahepatic bile duct's dilatation. Which one is the correct name of clinical sign?



- 1) drum stick sign.
- 2) keyboard sign.
- 3) hump sign.
- 4) parallel channel sign.

Q24. Following image shows severe liver atrophy and enlargement of spleen size also you could see ascites with abdominal distention as well. What is the arrow pointing at?

- 1) reverberation artifact.
- 2) floating bowel.
- 3) falciform ligament.
- 4) collateral various vein.



Q25. Which of the following is not relevant to the clause that is evaluating whether the liver has disease or not?

- 1) bilirubin
- 2) serum protein
- 3) prothrombin time
- 4) amylase

Q26. Which of the following is not correct answer about the bottom image?



- 1) It is well known to be happened because of secondary change as heart disease such as right heart failure.
- 2) It is usually diagnosed with hepatic vein dilatation or inferior vena cava dilatation.
- 3) There is generally liver enlargement and also thickening of gallbladder.
- 4) If there is a dilatation of hepatic vein, it is considered as a "Budd-chiari syndrome so the possibility of aorta obstruction would be considered during the scanning.

Q27. Which part of the bile duct would be obstructed, if the intrahepatic duct is dilated and the gallbladder is smaller than before?

- 1) around common bile duct
- 2) around ampulla Vater
- 3) the bottom part of cystic duct
- 4) the channel junction of the left and right bile duct.

Q28. Where is the location of spiral valve of Heister?

- 1) common bile duct.
- 2) cystic duct.
- 3) gallbladder.
- 4) common hepatic duct.

Q29. Which of the following is helping digestion with shrinking gallbladder, when a person eats some foods?

- 1) Glycogen
- 2) insulin
- 3) carboxypeptide
- 4) cholecystokinin

Q30. Which of the following is not relevant to the differential diagnosis of gallstone?

- 1) polypoid mass (cancer , polyp)
- 2) reverberation artifact
- 3) porcelain gall bladder
- 4) sludge ball

Q31. Which of the following is not relevant to the acute cholecystitis?

- 1) emphysematous cholecystitis
- 2) GB adenomyomatosis
- 3) GB perforation

- 4) GB empyema

Q32. Which is not correct answer about the anatomical structure around the pancreas?

- 1) The pancreas head is located in front of inferior vena cava.
- 2) Common bile duct is located in the posterolateral portion of pancreas head.
- 3) Superior mesenteric artery and superior mesenteric vein are located behind neck.
- 4) Pancreas head is located in the lateral side of duodenum's second portion.

Q33. Which enzyme is relevant to the diabetes?

- 1) Amylase
- 2) Insulin
- 3) Lipase
- 4) trypsin

Q34. Which of the following is not relevant to the pseudocyst of pancreas?

- 1) congenital pancreatic cyst.
- 2) acute and chronic pancreatitis.
- 3) blunt trauma.
- 4) pancreatic malignancy.

Q35. What is the reason of pressing the abdominal wall with probe during the pancreas examination?

- 1) To push out the gastro-intestinal air to the lateral and pancreas can be seen closer than former location.
- 2) Anterior and posterior width looks larger than before.
- 3) The splenic vein that is the indicator for finding pancreas is seen very well.
- 4) It reduces the scatter of ultrasound beam

Q36. Which one is not the reason of acute pancreatitis?

- 1) alcohol abuse
- 2) acute colitis
- 3) gallstone
- 4) ERCP

Q37. Which of the following is not relevant to the explanation of RE system?

- 1) It tells the phagocytic white blood cell
- 2) It is located in the liver, spleen, lymphocyte, bone marrow, Lung and etc.
- 3) It is relevant to the immunity of human body.
- 4) It resists outside infection of human body.

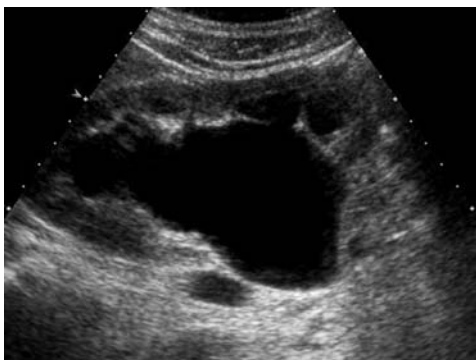
Q38. If the mass (like lesion) is not well seen in the segment 7 during Liver subcostal scan what kind of scan should be done?

- 1) make the patient left lateral decubitus position and do the intercostal scan
- 2) make the patient sitting position and do the subcostal scan
- 3) make the patient left lateral decubitus and do the subcostal scan
- 4) make the patient oblique position and do the subcostal scan

Q39. Many cystic structures are founded during the liver ultrasound. Which organ has the highest possibility of detecting many cyst at the same time?

- 1) thyroid
- 2) adrenal
- 3) kidney
- 4) breast

Q40. Which of the following is not correct answer about the bottom image?



- 1) A stone of ureter or mass can be the reason.
- 2) Renal function varies according to the period of treatment.
- 3) It has a possibility of developing as a pyonephrosis.
- 4) The occurrence of left kidney hydronephrosis is more frequent than right kidney.

Q41. Which of the following is correct answer about the bottom image?



- 1) It occurs because of mucosal damage.
- 2) It occurs by nature and usually seen in adults.
- 3) It becomes smaller with bladder after urination.
- 4) The possibility of occurrence rate of stone is very low.

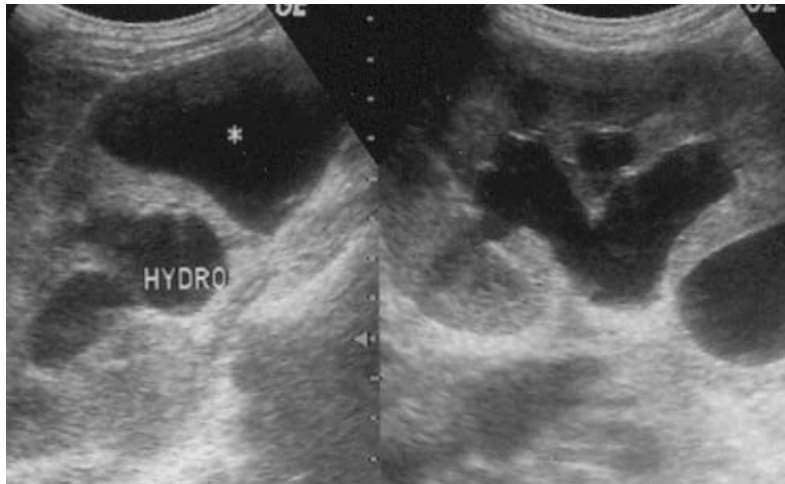
Q42. Which one is not correct answer about the method of kidney scan?

- 1) Liver can be used as a acoustic window when the right kidney is scanned.
- 2) Spleen can be used as a acoustic window when the left kidney is scanned.
- 3) When the kidney is scanned by Doppler method with right subcostal scan, the normal respiration method is used.
- 4) Kidney can be scanned in prone position.

Q43. Which of the following is not correct answer about parapelvic cyst?

- 1) It occurs at the cortex of kidney.
- 2) It looks like a renal sinus mass at the excretory urography.
- 3) There is posterior acoustic enhancement because of cyst.
- 4) It distinguishes from the hydronephrosis because it is not communicated with collecting system.

Q44. Which of the following is not correct answer about the bottom image?



- 1) It is about hydronephrosis.
- 2) (\*) is a cyst of kidney
- 3) There could be ureteral obstruction.
- 4) It has to be confirmed that the separate collecting system are communicated each other.

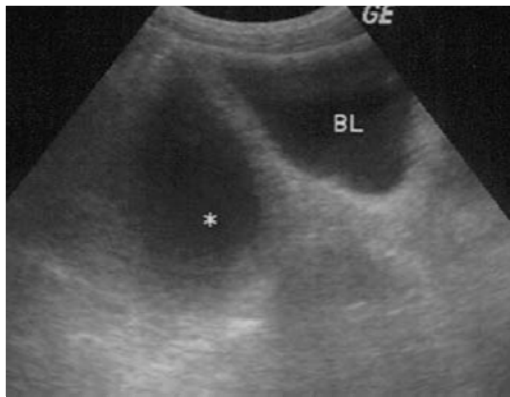
Q45. Which congenital anomalies is shown at the bottom of image?



- 1) horseshoe kidney
- 2) agenesis
- 3) persistent fetal lobulation
- 4) renal column hyperplasia

Q46. The star (\*) indicates the virtual image (illusion) because of multipath reflection.

How can it be distinguished from the other disease?



- 1) Fill the urine sufficiently to be seen well.
- 2) It is hard to be distinguished from the large cystadenoma of pelvis.
- 3) Do the scan after voiding
- 4) It is appeared when the small quantity of urine is existed.

Q47. What is the anatomical name that arrow is pointing at the bottom of image?



- 1) peritoneal cavity
- 2) hartmann pouch
- 3) Morison's pouch
- 4) psoas muscle

Q48. Which splenic variation can be seen after splenectomy?

- 1) accessory spleen



- 2) born-again spleen
- 3) wandering spleen
- 4) upside-down spleen

Q49. Which one is the correct answer about pelvic kidney?

- 1) The location is changing according to the respiration.
- 2) There is vermicular movements (peristalsis)
- 3) It can have a function or have not
- 4) Its anatomical function is perfectly normal.

Q50. Which one is the main reason of obstructive jaundice?

- 1) cholelithiasis
- 2) choledocholithiasis
- 3) acalculous cholecystitis
- 4) cholecystitis

Q51. Which one has the highest possibility of small bowel obstruction?

- 1) hernia
- 2) adhesion
- 3) neoplasm
- 4) Crohn's disease

Q52. Which of the following ultrasonography is not relevant to the acute appendicitis?

- 1) pendicolith
- 2) appendix diameter over 7mm
- 3) swelling of psoas muscle
- 4) compressible appendix

Q53. Which of the following is the organ of retroperitoneum?

- 1) stomach, liver , spleen
- 2) pancreas, kidney , spleen
- 3) pancreas, gallbladder , spleen
- 4) pancreas, kidney , adrenal glands

Q54. Which one is not correct answer about the carotid artery's ultrasonic image?



- 1) There is an atheroma in the carotid artery bifurcation.
- 2) The atheroma usually appears in the blood bifurcation.
- 3) It is an essential media disease.
- 4) When the study of spectral Doppler on the marking in the above image, blood flow is increasing.

Q55. Which one is correct answer about parathormone?

- 1) It increases the calcium concentration of blood as the liberation of the calcium inside bone.
- 2) It increases the sodium concentration of blood.
- 3) It increases the insulin concentration of blood.
- 4) It increases the potassium concentration of blood.

Q56. Where is the main lymph gland's location in head and neck?

- 1) inside of the carotid artery.
- 2) in front of thyroid isthmus
- 3) in front of internal jugular vein
- 4) in front of subclavian artery

Q57. Which one is not true answer about obstetrical ultrasound?

- 1) Embryo is called up to eight weeks of gestation.
- 2) Gestation of the first trimester can measure the length of CRL(crown rump length)
- 3) The gestation sac in early pregnancy is normal to be observed as the oval
- 4) The gestation instrumentation after the second trimester also use humerus. Humerus length of gestation also uses instrumentation.

Q58. Below image was acquired by transverse scan on abdominal aorta. Which of the following is the anatomical name of the arrow?



- 1) superior mesenteric artery
- 2) inferior mesenteric artery
- 3) splenic artery
- 4) hepatic artery

Q59. This is the image of intercostal scan of right kidney. Which of the following is the anatomical name of the arrow?



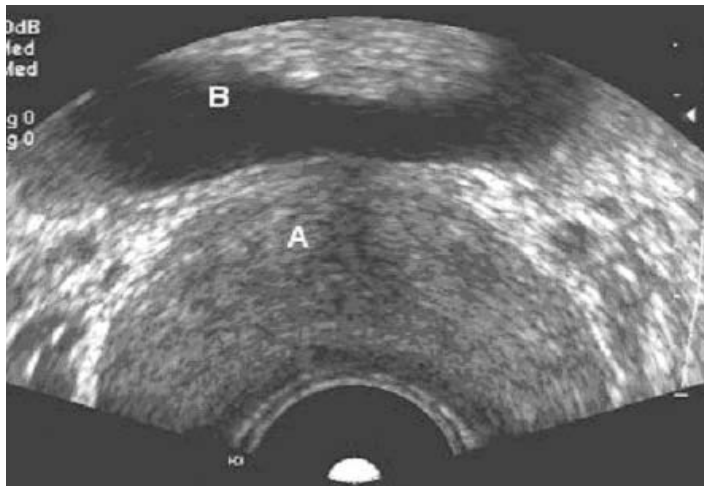
- 1) transverse colon
- 2) hepatic flexure
- 3) splenic flexure
- 4) sigmoid colon

Q60. Which one is not true to can be not observed in GB?

- 1) reverberation artifact
- 2) side lobe artifact
- 3) ring down artifact
- 4) lens effect

Q61. Which of the following is not correct about below image?

- 1) The anatomical name of A is prostate.
- 2) The anatomical name of B is urinary bladder.
- 3) Probe should be covered with latex cover for infection control during procedure.
- 4) This image was acquired by using radial probe in rectum.



Q62. Which one is not relevant with the cause of splenic infarct?

- 1) splenomegaly
- 2) thrombosis
- 3) pancreatitis
- 4) leukemia

Q63. Which of the following is not correct about primary cancer of spleen?

- 1) It is mostly non-Hodgkin's lymphoma
- 2) It is accompanied by diffuse splenoma
- 3) It is to spread to other organs
- 4) Echo intensity is mostly low and diverse

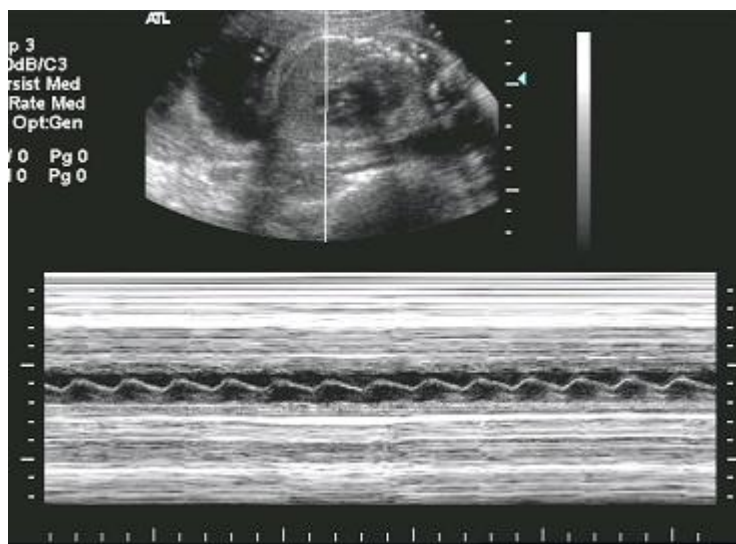
Q64. Below image was acquired by transverse scan on spleen. Which of the following is the anatomical name of the arrow?



- 1) splenic vein
- 2) splenic hemangioma
- 3) accessory spleen
- 4) splenic cyst

Q65. What is the name of below study?

- 1) EKG
- 2) M-mode sonogram
- 3) spectral Doppler
- 4) C-mode sonogram



Q66. Which of the following is correct about symptom of abdominal aortic aneurysm?

- 1) pulse of lower blood will be increased
- 2) It is mostly occurred in elderly people
- 3) It feels pulsating lump
- 4) pulse of lower blood will be gradually decreased

Q67. Which of the following study is not correct about abdominal Doppler?

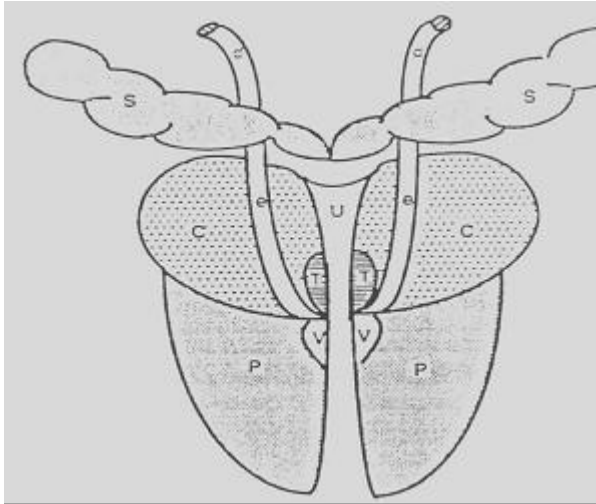
- 1) It can find out the blood direction by Color Power Doppler (or Color Doppler Energy)
- 2) Spectrum and color Doppler signal are acquired by longitudinal, coronal, oblique or transverse planes
- 3) Color sensitivity can be improved by control of PRF or color velocity scale
- 4) Doppler angle is mostly measured by 30 to 60 degree

Q68. Below image was acquired from female lower abdomen. Which of the following is the anatomical name of the arrow?

- 1) endometrium
- 2) follicle
- 3) rectum wall
- 4) cervix



Q69. Where is the main area to occur prostatic hypertrophy in the following anatomical structure?



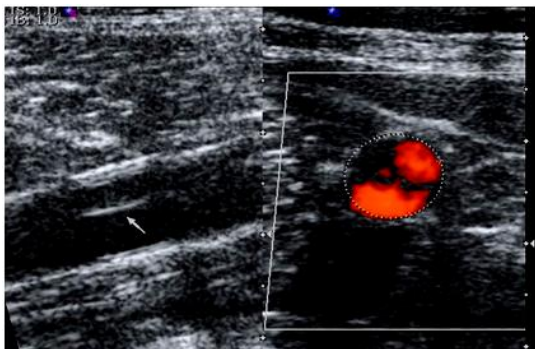
- 1) V (verumontanum)
- 2) T (transitional zone)
- 3) C (central zone)
- 4) P (peripheral zone)

Q70. Which one is the thickest period for the endometrium thickness measurement of observing sites during pelvic ultrasound of childbearing women?

- 1) menstrual stage
- 2) secretory stage
- 3) proloferative stage
- 4) the same stage

Q71. This image is the longitudinal view of the same location as abdominal aortic transverse view. Which one is the proper diagnosis?

- 1) abdominal aortic aneurysm
- 2) atherosclerosis
- 3) aortic dissection
- 4) deep vein thrombosis



Q72. Which of the following is not the reason for GB enlargement?

- 1) prolonged fasting
- 2) ascites anteriorly the peritoneum
- 3) IV hyperalimentation
- 4) cystic duct obstruction (Hydrops of gallbladder)

Q73. Which of the following can change ultrasonic beam by TGC?

- 1) velocity
- 2) attenuation
- 3) reflection
- 4) refraction

Q74. Which one is the reason of reflection around the tissue boundary?

- 1) absorption
- 2) attenuation
- 3) impedance change
- 4) velocity change

Q75. Which one is not correct factor that decides speed of sound inside the medium of ultrasound?

- 1) frequency
- 2) density
- 3) stiffness
- 4) elasticity

Q76. Which one is not correct for acoustic variable?

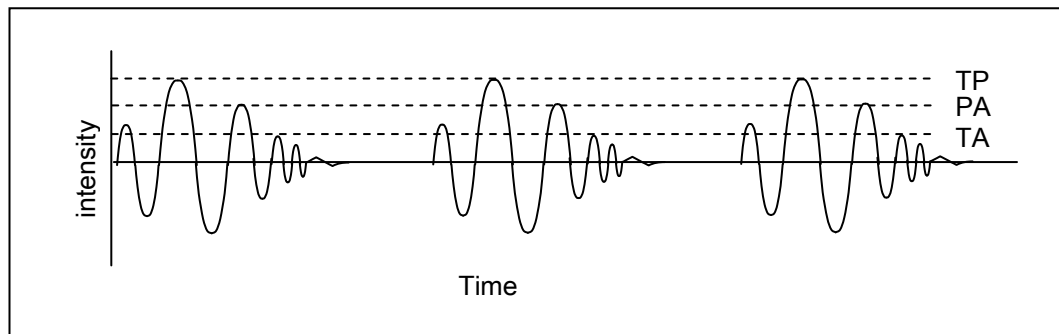
- 1) pressure
- 2) density
- 3) temperature
- 4) frequency

Q77. If the ultrasound intensity is changed to -6dB, how much the final intensity will be changed?

- 1) 1/4 times
- 2) 4 times
- 3) 1/10 times
- 4) 10 times



Q78. The bottom graph shows the beam temporal intensity of pulse wave method, which one is lowest intensity?



- 1) TP (temporal peak)
- 2) PA (pulse average)
- 3) TA (temporal average)
- 4) SP (spatial peak)

Q79. How can the sonographer make ultrasound as low as possible?

- 1) low transmission output , low reflecting gain control.
- 2) low transmission output , high reflecting gain control.
- 3) high transmission output , low reflecting gain control.
- 4) high transmission output , low reflecting gain control.

Q80. Which one is not correct answer about three factors of Doppler effect?

- 1) Incident frequency that is corresponding to the sound source.
- 2) Pulse repetition frequency.
- 3) The receiver who can hear the sound source.
- 4) RBC that is corresponding to the reflector.

Q81. Rayleigh scatter is the scattering light, by particles much smaller than the wavelength of the light. It is also applied to RBC in blood flow. These scatter ray affect as the important factor for occurrence of echo in blood flow ultrasound. Which of the following is not true?

- 1) The density of scatterer is not relevant to occurrence of echo
- 2) Scatter ray increases proportionally transmission frequency by quadrate times
- 3) Back scattered radiation will be increased when the size of scatterer is getting bigger
- 4) It affects as the important factor for occurrence of echo as the difference of acoustic resistance is getting bigger

Q82. Which one is the method of removing the aliasing artifact in spectral Doppler?

- 1) Raise the frequency of probe.
- 2) Reduce the incidence angle.
- 3) Reduce the pulse repetition frequency.
- 4) Reduce the sample gate depth.

Q83. Which one is the most suitable thickness of matching layer?

- 1)  $\frac{2}{3}$  of wave length.
- 2)  $\frac{1}{4}$  of wave length.
- 3)  $\frac{1}{2}$  of wave length.
- 4)  $\frac{3}{4}$  of wave length.

Q84. Which of the following is correct answer?

- 1) continuous wave Doppler can't know about depth information.
- 2) continuous wave Doppler makes aliasing artifact sometimes.
- 3) continuous wave Doppler measures the blood speed in sample gate.
- 4) the advantage of pulse wave Doppler is measuring of very slow blood speed.

Q85. Which of the following is not correct on "ALARA"?

- 1) Medical ultrasound machine can be used only for medical reason.
- 2) Sonographer is well informed of machine's manual.
- 3) Reducing the scanning time as much as possible.
- 4) It always has to require the high real time frame rates.

Q86. Which one is the not correct answer about dead zone?

- 1) Dead zone area cannot be used as a clinical data.
- 2) This is about the distance from the transducer's surface to the echo that is recognized firstly in patient interface.
- 3) The higher frequency makes the dead zone size smaller.
- 4) Transmission and reception happens at the same time in dead zone.

Q87. Which one is not correct answer about near field length?

- 1) Transducer diameter
- 2) wavelength
- 3) delay time
- 4) frequency

Q88. Which transducer can't do the electronically steer?

- 1) linear sequenced array.
- 2) annular phased array.
- 3) linear phased array.
- 4) convex sequence array

Q89. Which of the following is not correct answer about biological interaction of ultrasound?

- 1) heating
- 2) ionization
- 3) cavitation
- 4) thermal

Q90. Which of the following is not correct answer about QA?

- 1) Sensitivity is the maximum depth can be observed reflected signal in the image.
- 2) The accuracy of the vertical and the horizontal distance should be measured.
- 3) Spatial resolution is evaluated as slice thickness, axial resolution, lateral resolution.
- 4) Axial resolution is to see the distinction of continuous reflector from transverse direction on the axial.