**中山大学**

本科课程教学大纲

学院（系）医学部

课程名称 医学影像学

**二〇二五年**

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课程教学大纲

（编写日期：2024年1月）

**一、课程基本信息**

|  |
| --- |
| 医学影像学Medical Imaging |
| 课程类别 | 专选 | 课程编码 | AH3052 | 开课单位 | 医学部 |
| 学分 | 4 | 学时 | 66 | 授课年级 | 大三 |
| 面向专业/大类 | 预防医学Public Health |
| 课程负责人 | 覃杰 |
| 先修课程 | 人体解剖学、生理学、病理学、病理生理学、诊断学 |
| 课程目标 | 1. 教学目的：《医学影像学》的教学任务和教学目标是以培养人民满意的医生为宗旨，使学生能比较牢固地掌握本门课程的基础理论、基本知识和基本技能，在教学过程中还必须加强学生的全面观察、系统分析的临床思维能力的锻炼，为以后的临床实践打下基础。2. 教学基本要求：教师在教学活动中必须加强思政教育。首先较强树立学生的爱国主意情怀，践行社会主义核心价值观，培养学生树立治病救人、关爱患者的医学人文精神。教师自身应具备思政教育的思想意识，重视执行思政教育，在课堂及日常行为中注意言传身教、教书育人，寓医德于教学之中。强化以人为本的观念，将人文关怀、职《医学影像学》教学大纲将医学影像学理论分为牢固掌握、一般掌握、一般了解三个层次，以指导学生学习。本课程主要培养学生对常见疾病的影像学综合诊断能力。通过理论课与实习课教学，要求学生牢固掌握医学影像学的基础知识与基本技术原理，牢固掌握常见疾患的影像学表现和诊断、鉴别诊断方法和介入治疗的原则；一般掌握各类影像检查技术在各系统疾病的应用特点；一般了解医学影像学的新进展和新技术；能综合运用医学影像学信息来解决临床实际问题（具体要求详见各章节的教学要求。）。   |

**二、课程基本内容**

## （一）课程内容

### 1. 学时分配

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 编号 |  | 教学内容 | 总学时数 | 理论学时 | 实验学时 |
| 1 | 第1周 | 第一篇 总论 第一章 X线成像第二章 计算机体层成像第三章 磁共振成像第四章 超声成像第五章 影像诊断中的对比剂第六章 影像的分析与诊断第七章 如何阅读影像检查报告第八章 介入影像学简介第九章 图像储存与传输第十章 医学影像新进展 | 4 | 4 | 0 |
| 2 | 第2-4周 | 第二篇 胸部 第一章 肺与纵隔、横膈 | 12 | 6 | 6 |
| 3 | 第4-5周 | 第二篇 胸部 第二章 心脏与大血管 | 6 | 4 | 2 |
| 4 | --- | 第二篇 胸部 第三章 乳腺（自学） | 0 | 0 | 0 |
| 5 | 第5-8周 | 第三篇 腹部 第一章 食管与胃肠道 | 12 | 6 | 6 |
| 6 | 第三篇 腹部 第二章 肝、胆、胰、脾 |
| 10 | 第三篇 腹部 第五章 急腹症 |
| 11 |  | 第三篇 腹部 第四章 生殖系统（自学） | 0 | 0 | 0 |
| 7 | 第9周 | 第六篇 介入影像学的临床应用第一章 中枢和头颈部第二章 呼吸系统第三章 循环系统第四章 消化系统第五章 泌尿系统第六章 盆腔介入治疗第七章 骨骼、肌肉系统 | 2 | 2 | 0 |
| 8 | 第9-10周 | 期中测试 | 0 | 0 | 0 |
| 12 | 第9-11周 | 第四篇 骨、关节和软组织第一章 骨 | 8 | 4 | 4 |
| 13 | 第四篇 骨、关节和软组织第二章 脊柱 |
|  | 第四篇 骨、关节和软组织第三章 关节 |
| 14 | 第四篇 骨、关节和软组织第四章 软组织 |
| 9 | 第12周 | 第三篇 腹部 第三章 泌尿系统、肾上腺及腹膜后间隙 | 4 | 2 | 2 |
| 16 | 第13-14周 | 第五篇 中枢神经系统和头颈部第一章 脑 | 6 | 5 | 1 |
| 15 | --- | 第五篇 中枢神经系统和头颈部第二章 脊髓（自学） | 0 | 0 | 0 |
| 16 | ---- | 第五篇 中枢神经系统和头颈部第三章 头颈部（自学） | 0 | 0 | 0 |
| 18 | 第15-17周 | 第七篇 超声医学第一章 超声诊断学基础第二章 腹部疾病超声诊断第三章 浅表器官和血管疾病的超声诊断第四章 妇产科疾病超声诊断第五章 心血管疾病超声诊断第六章 介入超声学 | 12 | 8 | 4 |
| 总计 |  | 66 | 39 | 25 |

### 2. 教学进度表

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **章节次序及名称** | **主要教学内容** | **所需学时** | **育人元素** | **重点、难点** | **周次** | **备注** |
| 第一篇 总论第一章 X线成像 | （1）X线成像原理、X线的性质（2）X线检查的安全和防护知识（3）X线检查技  | 1 | 介绍伦琴、谢志光等名人对放射学的贡献，激发同学们的学习热情、探索精神 | （1）X线的产生和特性（2）人体组织密度与厚度的差别，自然对比（3）造影检查：对比剂引入的方法和途径，人工对比 | 第1周 |  |
| 第一篇 总论第二章 计算机体层成像 | （1）CT的成像基本原理与设备 （2）CT图像特点（3）CT检查技术 CT  | 1 | CT在技术上相对于X线平片具有巨大进步，适应证广，有助于辅助临床精准诊断 | （1）CT的成像基本原理（2）CT图像特点，CT值，窗宽、窗位的定义和应用 | 第1周 |  |
| 第一篇 总论第三章 磁共振成像 | （1）MRI的成像基本原理与设备（2）MRI图像特点（3）MRI检查技术 MR  | 1 | MRI检查无电离辐射，软组织分辨率高，功能成像的发展大大提高了影像诊断的准确性，有效辅助临床决策  | （1） MRI图像特点， T1、T2、T1WI、T2WI的含义（2）影响磁共振信号强度的因素 | 第1周 |  |
| 第一篇 总论第四章 超声成像 | 自学  | 0 |  |  |  |  |
| 第一篇 总论第五章 影像诊断中的对比剂 | （1）X线对比剂：阳性对比剂和阴性对比剂（2）磁共振对比剂（3）对比剂的安全性和不良反应 | 0.3 | 对比剂的应用是医学影像学的巨大进步，大大提高了图像分辨能力 | （1）重点：对比剂的分类、作用原理和应用范围（2）难点：碘对比剂副反应的临床表现和预防措施 | 第1周 |  |
| 第一篇 总论第六章 影像的分析与诊断 | （1）影像诊断原则和步骤（2）X线、CT、MR读片分析方法（3）人工智能在影像诊断中的应用  | 0.2 | 诊断和鉴别诊断的方法体现辩证唯物主义的哲学思维 | 重点及难点：医学影像诊断的原则和步骤 | 第1周 |  |
| 第一篇 总论第七章 如何阅读影像检查报告 | （1）影像检查的一般信息 （2）明确影像检查的名称和技术方法（3）阅读影像检查报告的影像征象的描述内容 （4）准确理解影像学检查报告的诊断结论 | 0.2 | 临床-影像结合，培养综合思维，同时注重医德教育，关爱患者 | 重点：正确的阅读图像的方法难点：阅读、评价影像学检查报告的方法和注意事项 | 第1周 |  |
| 第一篇 总论第八章 介入影像学简介 | 自学 | 0 |  |  |  |  |
| 第一篇 总论第九章 图像储存与传输 | （1）PACS的基本原理与结构 （2）PACS的临床应用  | 0.1 | 大数据时代医学影像学数据管理具有重要作用，提高了，影像医师工作效率和诊疗模式的转变，在应用过程中须注意信息安全 | 重点及难点：图像存储与传输系统的基本结构及其在放射科和医院数字化、信息化中的作用 | 第1周 |  |
| 第一篇 总论第十章 医学影像新进展 | 计算机辅助诊断的概念和人工智能在影像诊断中的应用 | 0.2 | 高级计算机算法的运用在医学影像学中具有广泛运用前景，需要注重医工结合，才能更好地提高诊断水平  | 重点及难点：计算机辅助诊断及人工智能在影像诊断中的应用及价值 | 第1周 |  |
| 第二篇 胸部第一章 肺与纵隔、横膈 | （1）肺与纵隔的正常影像解剖（2）肺与纵隔病变的基本影像学征象（3）肺与纵隔病变的影像学诊断 | 12 | 由肺炎引出疫情中英雄事迹及抗疫精神 | （1）重点：肺炎、结核、支气管肺癌、肺转移瘤、纵隔常见肿瘤的影像表现（2）难点：良恶性肺结节鉴别，空洞的鉴别诊断 | 第2周至第4周 |  |
| 第二篇 胸部第二章 心脏与大血管 | （1）心脏和大血管的正常影像解剖（2）心脏和大血管病变的基本影像学征象 （3）心脏和大血管疾病的影像学诊断 | 8 | 心血管疾病发病率逐年增高，医学影像学在疾病的预防、早期诊断、疗效评估中发挥着重要作用 | （1）重点：房间隔缺损、法乐氏四联症等常见病影像学表现（2）难点：肺充血与肺淤血的鉴别 | 第4周、第5周 |  |
| 第二篇 胸部第三章 乳腺 | 自学 | 0 |  |  |  |  |
| 第三篇 腹部第一章 食管与胃肠道 | （1）食管和胃肠道的正常影像解剖（2）食管和胃肠道病变的基本影像学征象（3）食管和胃肠道常见疾病的影像学诊断  | 8 | 消化道疾病严重危险我国人民健康，医学影像学在消化道疾病的早期诊断、术前分期、疗效评估中具有重要价值 | （1）重点：食管癌、静脉曲张、胃及十二指肠溃疡、胃癌、结直肠癌等常见病的影像学表现（2）难点：食管癌与静脉曲张的鉴别诊断，良恶性胃溃疡的鉴别诊断 | 第6周 |  |
| 第三篇 腹部第二章 肝、胆、胰、脾 | （1）肝脏、胆道系统、胰腺、脾脏的正常影像解剖及基本异常影像学征象（2）肝脏、胆道系统、胰腺常见病、多发病的影像学诊断 | 4 | 乙肝患者的减少体现了国家对控制传染病的决心 | （1）重点：原发性肝细胞癌、海绵状血管瘤、肝硬化、肝囊肿、急性胰腺炎、胆石症等常见病的影像学表现（2）难点：原发性肝细胞癌与海绵状血管瘤的鉴别诊断 | 第7周 |  |
| 第三篇 腹部第五章 急腹症 | （1）与急腹症有关的正常影像解剖（2）急腹症基本影像学征象（3）常见急腹症的影像学诊断（4）急腹症影像学检查方法的比较和选择  | 4 | 快速、精准的诊断对急腹症患者的救治至关重要，医学影像学在急腹症患者的诊断中发挥越来越重要的作用 | （1）重点：消化道穿孔、肠梗阻、肠套叠的等常见急腹症的影像学表现（2）难点：肠梗阻定性诊断 | 第8周 |  |
| 第三篇 腹部第四章 生殖系统 | 自学 | 0 |  |  |  |  |
| 第四篇 骨、关节和软组织第一章 骨 | （1）骨的正常影像学表现 （2）骨病变的基本影像学征象及其病理基础（4）骨骼系统疾病的影像学诊断 | 4 | 临床-影像-病理三结合对骨肿瘤诊断的重要性，体现了团队合作精神，提高了诊断的准确性 | （1）重点：理解骨关节基本病变的X线、CT、MRI表现及其病理基础；将不同的骨关节基本病变运用到临床实践中分析具体的骨关节疾病的影像学表现（2）难点：骨骼系统常见病、多发病的影像学诊断与鉴别诊断，骨质疏松与骨质软化的鉴别，骨髓瘤与转移瘤的鉴别 | 第9周 |  |
| 第四篇 骨、关节和软组织第二章 脊柱 | （1）脊柱的正常影像解剖 （2）脊柱病变的基本影像学征象 （3）脊柱基本的影像学诊断（4）脊柱疾病影像学检查方法的比较和选择  | 2 | 脊柱疾病是临床常见病，医学影像学为脊柱病变评估提供重要的参考依据 | （1）重点：理解脊柱基本病变的X线、CT、MRI表现及其病理基础；将不同的基本病变运用到临床实践中分析具体的脊柱疾病的影像学表现（2）难点：脊柱常见病、多发病的影像学诊断与鉴别诊断，脊柱结核与转移瘤的鉴别 | 第10周 |  |
| 第四篇 骨、关节和软组织第三章 关节 | （1）关节的正常影像解剖 （2）关节病变的基本影像学征象（3）关节疾病的影像学诊断（4）关节疾病影像学检查方法的比较和选择  | 1 | 关节疾病是临床常见病，医学影像学为关节病变评估提供重要的参考依据 | （1）重点：理解关节基本病变的X线、CT、MRI表现及其病理基础；将不同的基本病变运用到临床实践中分析具体的关节疾病的影像学表现（2）难点：关节常见病、多发病的影像学诊断与鉴别诊断，化脓性关节炎与关节结核的鉴别 | 第11周 |  |
| 第四篇 骨、关节和软组织第四章 软组织（自学） | （1）软组织的正常影像解剖（2）软组织病变的基本影像学征象（3）软组织疾病影像学检查方法的比较和选择 | 1 | 软组织肿瘤是相对少见的疾病，医学影像学对软组织肿瘤的侵犯范围、定性诊断提供重要的参考信息 | （1）重点：理解软组织基本病变的X线、CT、MRI表现及其病理基础；将不同的基本病变运用到临床实践中分析具体的软组织疾病的影像学表现（2）难点：软组织常见病、多发病的影像学诊断与鉴别诊断 |  |  |
| 第三篇 腹部第三章 泌尿系统、肾上腺及腹膜后间隙 | （1）泌尿系的正常影像解剖（2）泌尿系病变的基本影像学征象（3）泌尿系常见疾病的影像学诊断 | 4 | 泌尿系统疾病是临床常见疾病，医学影像学在疾病的诊断、疗效评估中具有重要作用 | （1）重点：泌尿系结石，结核，肾盂癌，肾癌，肾囊肿与多囊肾等常见疾病的影像表现（2）难点: ① 静脉肾盂造影片：输尿管正常形态与扩张、狭窄的鉴别；肾积液的肾盏表现；肾盂、肾盏破坏，受压、充盈缺损的表现② 肾结石与钙化的鉴别。Differential diagnosis of calculus and calcification③ CT片：肾实质空洞、脓肿与囊肿、肾盏积液的鉴别；肾盂癌与肾盂血肿的鉴别。肾结核、肾癌的CT诊断 | 第12周 |  |
| 第五篇 中枢神经系统和头颈部第一章 脑 | （1）脑的正常影像解剖 （2）颅脑病变的基本影像学征象（3）颅脑基本的影像学诊断（4）颅脑疾病影像学检查方法的比较和选择  | 4 | 介绍健康中国2030规划纲要的相关内容，指出国家对卫生健康领域的重视，强调神经解剖在医学教育的重要性 | （1）重点：脑梗塞、脑出血、星形细胞瘤、垂体瘤、听神经瘤、硬膜下出血、硬膜外出血等常见病的影像学表现（2）难点：脑梗塞与肿瘤的鉴别诊断，硬膜下出血与硬膜外出血的鉴别诊断 | 第13-15周 |  |
| 第五篇 中枢神经系统和头颈部第二章 脊髓  | 自学 | 0 |  |  |  |  |
| 第五篇 中枢神经系统和头颈部第三章 头颈部 | 自学 | 0 |  |  |  |  |
| 第六篇 超声医学第一章 超声诊断学基础 | （1）超声医学的概述（2）超声波的物理特性（3）超声波的产生及超声成像的基本原理（4）超声诊断的技术原理（5）超声诊断新技术介绍 | 1 | 作为无创、简便、无电离辐射的检查方法，超声检查在疾病筛查及评估中发挥重要作用 | （1）重点：二维实时灰阶断面成像原理及声像特点，彩色多普勒血流图及频谱图的成像原理及图像特点，M型超声心动图原理及特点，人体不同组织成分的声像图表现，超声声像图主要观察内容及分析方法，超声诊断的局限性（2）难点：人体不同组织成分的声像图表现，超声声像图主要观察内容及分析方法，囊实性、良恶性病灶的声像图对比，超声伪像的识别与利用 | 第15周 |  |
| 第六篇 超声医学第二章 腹部疾病超声诊断 | （1）正常肝脏、胆囊及肝内外胆管、胰腺、脾脏及肾脏解剖及声像图特点（2）腹部疾病超声诊断（3）泌尿系统超声检查方法（4）超声检查在泌尿系统的应用（5）肾结石、肾积液、肾囊肿、肾肿瘤、膀胱结石、膀胱肿瘤的典型声像图表现  | 3 | 超声技术的发展大大提高了图像分辨率，为腹部疾病诊断提供重要参考信息 | （1）重点：原发性肝癌、肝转移癌、胆道结石、胆囊癌、胆管癌、胰腺癌、急慢性胰腺炎的超声诊断；常见肾脏囊性病变的超声表现（2）难点：原发性肝癌与肝转移癌超声鉴别诊断，胆囊癌的分型及超声诊断 | 第15周 |  |
| 第六篇 超声医学第三章 心血管疾病超声诊断 | （1）超声心动图检查的基本方法及正常图像特征（2）风湿性心脏病、先天性心脏病、心肌病、冠心病、心包疾病的超声诊断 | 2 | 心血管系统疾病是临床常见病，严重威胁人民健康，超声检查在心血管系统疾病的筛查和疾病评估中发挥重要作用 | （1）重点：M型超声心动图二尖瓣活动曲线特征及意义，风湿性心脏病二尖瓣狭窄及关闭不全的超声征象，先天性心脏病房间隔缺损与法洛四联症的超声征象（2）难点：理解二维超声行动图常用切面，理解频谱多普勒超声的临床应用 | 第16周 |  |
| 第六篇 超声医学第四章 浅表器官和血管疾病的超声诊断 | （1）甲状腺、乳腺、体表、生殖器、血管的正常解剖声像特点 （2）检查方法（3） 常见浅表及血管疾病的超声诊断  | 3 | 甲状腺、乳腺、血管疾病是临床常见病，超声检查在浅表及血管疾病的筛查和疾病评估中发挥重要作用。 | 常见甲状腺、乳腺、血管疾病的超声表现 | 第16周 |  |
|  |  |  |  |  |  |  |
| 第六篇 超声医学第七章 妇产科疾病超声诊断 | （1）妇科疾病超声诊断（2）产科疾病超声诊断  | 2 | 妇科系统疾病是临床常见病，超声检查在妇科疾病的筛查和疾病评估中发挥重要作用 | （1）重点：各期流产的超声表现，各型异位妊娠的超声表现，前置胎盘超声分类分型，胎盘早期剥离超声表现，葡萄胎临床与超声表现，恶性滋养细胞疾病临床与超声表现，子宫体与子宫基层病变的超声诊断，子宫腔与子宫内膜病变的超声诊断，卵巢病变的超声诊断（2）难点：各期流产的超声表现与临床分型的相关性，异位妊娠的临床转归，鉴别诊断，滋养细胞疾病的临床特征与超声表现的相关性，子宫体与子宫肌层病变的超声鉴别诊断，子宫腔与子宫内膜病变的超声鉴别诊断，卵巢病变的超声鉴别诊断 | 第17周 |  |
| 第六篇 超声医学 | （1）常用介入治疗术 （2）超声内镜基础知识 （3）术中超声基础知识  | 1 | 介入超声的发展，大大拓展的疾病精准微创治疗的适应证 | 重点及难点：介入超声应用范围、适应症、禁忌症  | 第17周 |  |
| 第七篇 介入影像学的临床应用介入超声学 | （1）消化道出血介入治疗（2）肝癌经导管动脉化疗栓塞 （3）经颈经脉肝内门体支架分流术 （4）腹腔囊肿穿刺引流术（5）腹腔脓肿穿刺引流术 | 0.3 | 新诊疗手段体现了创新精神 | 重点及难点：消化系统出血、肝癌的介入治疗方法 | 第17周 |  |

### 3.教学要求：Teaching requirements

### 第一篇 总论 （教学时数 4学时） Overview (4 class hours)

医学影像学是利用各种影像学方法进行疾病诊断和引导介入治疗的一门独立的、成熟的临床学科，主要包括X线、CT、MRI、影像介入、核医学及超声诊断学。

Medical imaging is an independent, mature clinical discipline for disease diagnosis and guidance of interventional treatment utilizing various imaging methods. It mainly consists of X-ray, CT, MRI, interventional imaging, nuclear medicine and ultrasound diagnostics.

### 第一章 X线成像 X-ray imaging

**1、教学内容 Teaching contents**

（1）X线的产生和特性

Generation and characteristics of X-ray

（2）X线影像形成原理和密度的概念

 Principle of X-ray imaging and the concept of density

（3）X线检查方法

 X-ray examination methods

① 普通检查Routine examination

 1）透视Perspective 2）摄影 Photography

② 特殊检查 Special examination

高千伏摄影 High kilo voltage radiography

 ③ 造影检查 Contrast examination

（4）计算机X线成像 Computed X-ray imaging（DR、DSA）

① CR的成像原理与设备，CR的临床应用

 Imaging principle and equipment of computed radiography (CR). Clinical applications of CR.

② DR的成像原理与设备，DR的临床应用

 Imaging principle and equipment of digital radiography (DR). Clinical applications of DR.

③ 数字减影血管造影（DSA）:DSA的成像原理与设备；DSA的检查技术；DSA的临床应用。

 Digital Subtraction Angiography (DSA): Imaging principle and equipment of DSA. Examination methods of DSA. Clinical applications of DSA.

（5）X线检查方法的选择和综合应用Selection of X-ray examination methods and comprehensive application

阐明X线检查方法复杂繁多。要有目的地恰当地选择检查方法，并简述选择检查方法的一般原则。

Elaborate the variety of X-ray examination methods. Selection of examination methods should be purposive and appropriate. Briefly introduce the general principle of selection of methods.

（6）X线检查中的防护 Protection in X-ray examination

 ① 放射防护的意义；Significance of radiological protection

② 放射防护的方法和措施 Methods and measures of radiological protection

**2、教学基本要求 Basic requirement**

（1）掌握X线成像原理、X线的性质；

 Master imaging principle and character of X-ray;

（2）熟悉X线检查的安全和防护知识；

 Be familiar with knowledge of safety and protection in X-ray examination;

（3）了解常用的X线检查技术。

 Understand common X-ray examination technology

**3、重点和难点 Key points and difficult points**

（1）X线的产生和特性，主要是与影像学有关的X线特性

 Generation and characteristics of X-ray, especially the characteristics related to medical imaging.

（2）人体组织密度(density)与厚度的差别，**自然对比**

 Difference of human tissue density and thickness, nature contrast.

（3）造影检查：对比剂引入的方法和途径，**人工对比**

 Contrast examination: method and measures of introducing contrast agent, artificial contrast.

**4、育人元素**

介绍伦琴、谢志光等名人对放射学的贡献，激发同学们的学习热情、探索精神

Introduce the contributions of Roentgen, Xie Zhiguang and other celebrities to radiology to stimulate students' enthusiasm for learning and spirit of exploration.

**5、周次**

第1周

### 第二章 计算机体层成像（CT）Computed tomography (CT)

**1、教学内容 Teaching contents**

（1）CT的成像基本原理与设备 Basic principle and equipment of CT imaging

（2）CT图像特点 Characteristics of CT images

（3）CT检查技术 CT examination techniques

**2、教学基本要求 Basic requirement**

（1）掌握CT的成像原理；

 Master the basic principle of CT imaging;

（2）熟悉正确的阅读CT图像的方法；

 Be familiar with the correct method for CT image reading;

（3）了解CT设备的种类、常用的CT检查方法和图像后处理的方法。

 Understand types of CT equipment, common CT examination methods and image post-processing methods.

**3、重点和难点Key points and difficult points**

（1）CT的成像基本原理

 Basic principle of CT imaging

（2）CT图像特点，CT值，窗宽、窗位的定义和应用

 Character of CT images; CT value; definition and application of window width and window level.

**4、育人元素**

CT在技术上相对于X线平片具有巨大进步，适应证广，有助于辅助临床精准诊断Compared with plain X-ray film, CT has great progress in technology and wide indications, which helps to assist clinical accurate diagnosis.

**5、周次**

第1周

### 第三章 磁共振成像（MRI）Magnetic Resonance Imaging (MRI)

 **1、教学内容Teaching contents**

（1）MRI的成像基本原理与设备 Basic principle and equipment of MR imaging

（2）MRI图像特点 Characteristics of MR images

（3）MRI检查技术 MR examination techniques

**2、教学基本要求 Basic requirement**

1. 掌握MRI成像的基本原理和影响信号强度的因素；

Master the basic principle of MR imaging and signal intensity influencing factors;

（2）熟悉常用的MRI成像序列和各种主要的正常组织、病理组织的信号改变；

 Be familiar with common MRI sequences and the signal features of various normal and pathological tissues;

（3）了解MRI成像的基本设备和功能、成像的原理、方法和意义；了解功能影像学的基本概念。

 Understand basic MRI equipment and function, imaging principle, methods and significance.

**3、重点和难点 Key points and difficult points**

1. MRI图像特点， T1、T2、T1WI、T2WI的含义

Characters of MR images; definition of T1, T2, T1WI, T2WI.

1. 影响磁共振信号强度的因素

MR signal intensity influencing factors

**4、育人元素**

MRI检查无电离辐射，软组织分辨率高，功能成像的发展大大提高了影像诊断的准确性，有效辅助临床决策 MRI has no ionizing radiation and has high soft tissue resolution. The development of functional imaging has greatly improved the accuracy of image diagnosis and effectively assisted clinical decision-making.

**5、周次**

第1周

### 第四章 超声成像（详见超声教学大纲）Ultrasonography

### 第五章 影像诊断中的对比剂 Contrast agent for imaging diagnosis

**1、教学内容 Teaching contents**

（1）X线对比剂：阳性对比剂和阴性对比剂

 X-ray contrast agent: positive and negative contrast agent

（2）磁共振对比剂

MR contrast agent

（3）对比剂的安全性和不良反应

 Safety and adverse reactions of contrast agent

**2、教学基本要求 Basic requirement**

（1）熟悉对比剂的分类、作用原理和应用范围

 Be familiar with classification, mechanism and application of contrast agent.

（2）了解碘对比剂副反应的临床表现和预防措施

 Understand the clinical manifestation and preventive measures of contrast agent adverse reactions.

**3、重点与难点**

（1）重点：对比剂的分类、作用原理和应用范围

Classification, mechanism and application of contrast agent

（2）难点：碘对比剂副反应的临床表现和预防措施

The clinical manifestation and preventive measures of contrast agent adverse reactions

**4、育人元素**

对比剂的应用是医学影像学的巨大进步，大大提高了图像分辨能力The application of contrast agents is a great progress in medical imaging, which greatly improves the image resolution.

**5、周次**

第1周

### 第六章 影像的分析与诊断 Imaging analysis and diagnosis

**1、教学内容 Teaching contents**

（1）影像诊断原则和步骤

 Principles and procedures of imaging diagnosis

（2）X线、CT、MR读片分析方法

 Imaging reading and analyzing methods of X-ray, CT, MR.

1. 人工智能在影像诊断中的应用

 The use of AI in diagnostic radiology

**2、教学基本要求 Basic requirements**

掌握医学影像学检查的方法和原则、医学影像诊断的原则和步骤.

Master methods and principle of imaging examination; Master principles and procedures of medical imaging diagnosis.

**3、重点和难点 Key points and difficult points**

医学影像诊断的原则和步骤

 Principles and procedures of medical imaging diagnosis.

**4、育人元素**

诊断和鉴别诊断的方法体现辩证唯物主义的哲学思维。

The method of diagnosis and differential diagnosis embodies the philosophical thinking of dialectical materialism.

**5、周次**

第1周

### 第七章 如何阅读影像检查报告 How to read the imaging reports

**1、教学内容Teaching contents**

（1）影像检查的一般信息 general information of imaging examination

（2）明确影像检查的名称和技术方法 imaging examination name and technique

（3）阅读影像检查报告的影像征象的描述内容

Read the description of imaging features in the reports

（4）准确理解影像学检查报告的诊断结论

 Accurately understand the diagnostic conclusion in imaging examination reports.

**2、教学基本要求 Basic requirement**

（1）熟悉正确的阅读图像的方法

 Be familiar with the correct methods for imaging reading.

（2）了解阅读、评价影像学检查报告的方法和注意事项

 Understand the methods and matters needing attention for reading and accessing imaging examination reports.

**3、重点与难点**

重点：正确的阅读图像的方法

Correct methods for imaging reading

难点：阅读、评价影像学检查报告的方法和注意事项The methods and matters needing attention for reading and accessing imaging.

**4、育人元素**

临床-影像结合，培养综合思维，同时注重医德教育，关爱患者。

Combining clinical and imaging, cultivating comprehensive thinking, paying attention to medical ethics education and caring for patients.

**5、周次**

第1周

### 第八章 介入影像学 Interventional radiology

**1、教学内容 Teaching contents**

（1）介入影像学的基本概念

Basic concepts of interventional radiology.

 （2）介入影像学的基本设备、器械和基本技术

 Basic equipment, apparatus, instrument and techniques of interventional radiology.

 （3）介入影像学的基本分类及其临床应用概述

 Basic classification and clinical application of interventional radiology.

**2、教学基本要求 Basic requirement**

了解介入影像学的基本特点、基本操作技术、熟悉介入影像学在临床的基本应用以及了解介入影像学的有关影像设备、器械、材料、药物和介入操作后的反应和并发症。

 Understand general features and basic operating technique of interventional radiology; be familiar with clinical application of interventional radiology; understand the related imaging equipment, apparatus, instrument, material, medicine of interventional radiology, and the reaction and complication after interventional operation.

**3、重点与难点**

重点及难点：介入影像学的基本特点、基本操作技术和介入操作后的反应和并发症。

General features and basic operating technique of interventional radiology; The related imaging equipment, apparatus, instrument, material, medicine of interventional radiology, and the reaction and complication after interventional operation.

**4、育人元素**

介入检查和治疗手段不断提高，大大拓展了疾病微创治疗的适用范围。

The means of interventional examination and treatment are constantly improved, which greatly expands the application scope of minimally invasive treatment of diseases.

**5、周次**

第1周

### 第九章 图像存档和传输系统Picture Archiving and Communication System (PACS)

1. **教学内容 Teaching contents**

（1）PACS的基本原理与结构 Basic principle and structure of PACS

（2）PACS的临床应用 Clinical application of PACS

**2、教学基本要求Basic requirement**

了解图像存储与传输系统的基本结构及其在放射科和医院数字化、信息化中的作用。

Understand the basic structure of PACS and its role in digitization and informatization of radiology department and hospitals.

**3、重点与难点**

介入检查和治疗手段不断提高，大大拓展了疾病微创治疗的适用范围。

The means of interventional examination and treatment are constantly improved, which greatly expands the application scope of minimally invasive treatment of diseases.

**4、育人元素**

大数据时代医学影像学数据管理具有重要作用，提高了，影像医师工作效率和诊疗模式的转变，在应用过程中须注意信息安全。

Medical imaging data management plays an important role in the era of big data, which improves the work efficiency of imaging doctors and changes the diagnosis and treatment mode. Information security must be paid attention to in the application process.

**5、周次**

第1周

### 第十章 医学影像新进展 New advances in medical imaging

**1、教学内容 Teaching contents**

计算机辅助诊断的概念和人工智能在影像诊断中的应用

The concept of computer aided diagnosis and the application of artificial intelligence in image diagnosis

**2、教学基本要求Basic requirement**

了解计算机辅助诊断及人工智能在影像诊断中的应用及价值

Understand the application and value of computer aided diagnosis and the artificial intelligence in image diagnosis.

**3、重点与难点**

计算机辅助诊断及人工智能在影像诊断中的应用及价值。

The application and value of computer aided diagnosis and the artificial intelligence in image diagnosis.

**4、育人元素**

高级计算机算法的运用在医学影像学中具有广泛运用前景，需要注重医工结合，才能更好地提高诊断水平。

The application of advanced computer algorithm has a wide application prospect in medical imaging, and it is necessary to pay attention to the combination of medical and professional in order to improve the diagnostic level.

**5、周次**

第1周

### 第二篇 胸部（教学时数 20学时）Thorax (20 class hours)

### 第一章 肺与纵隔 lung and mediastinum

第一节 肺与纵隔的正常影像解剖 1学时

1. Normal imaging anatomy of lung and mediastinum

1. 肺野与肺门

 lung field and hila

1. 肺野：肺野的划分，肺纹理定义。

Lung field: Division of lung field. Definition of lung markings.

1. 肺门：肺门角的定义

Hila: Definition of hilar angle

1. 肺叶与肺段：熟悉肺叶与肺段的解剖

Pulmonary lobes and segments: Be familiar with the anatomy of pulmonary lobes and segments.

1. 气管与支气管

Trachea and bronchi

1. 纵隔与横膈：纵隔分区（九分法）

Mediastinum and diaphragm: division of mediastinum (rule of nine).

1. 胸膜与胸壁

Pleural and chest wall

1. 肺与纵隔病变的基本影像学征象

2. Common abnormal imaging signs of lung and mediastinum.

1. 肺的异常影像学征象

Abnormal imaging signs of lung

1. 局限性异常 localized abnormities
2. 片状影：渗出、支气管气像

Patchy opacities: exudation, air bronchogram

1. 条状影：strip opacities
2. 空洞影：厚壁空洞、薄壁空洞，空洞的鉴别诊断（脓肿、癌性空洞、结核）

Cavity: thick wall cavity; thin wall cavity; differential diagnosis of cavity (abscess, cancerous cavity and tuberculosis).

1. 空腔影：阐述与空洞的不同

Air containing space: explicit the difference between cavity and air containing space.

1. 结节影：定义、各种疾病的特征

Nodule: definition; characteristics of different kinds of diseases.

1. 肿块影：定义、各种疾病的特征

Mass: definition; characteristics of different kinds of diseases.

1. 钙化影 Calcification
2. 弥漫性病变 diffused lesion
3. 粟粒病变：定义、各种疾病的特征

Miliary lesion: definition; characteristics of different kinds of diseases.

1. 网状病变：reticular opacities
2. 支气管的异常影像学征象 Abnormal imaging signs of bronchi
3. 支气管扩张：形态

Bronchiectasis: shape and form

1. 支气管阻塞 bronchial obstruction
2. 阻塞性肺气肿：定义、病因、影像学表现

Obstructive emphysema: definition, pathogenesis, imaging features.

1. 阻塞性肺不张：定义、病因、影像学表现

Obstructive atelectasis: definition, pathogenesis, imaging features.

1. 阻塞性肺炎：定义、病因、影像学表现

Obstructive pneumonia: definition, pathogenesis, imaging features.

1. 肺门的异常影像学征象 Abnormal imaging signs of hila

肺门的大小改变，肺门的位置改变

Changes of hilar size and position.

四、纵隔的异常影像学征象 Abnormal imaging signs of mediastinum

（一）纵隔的位置改变：原因、影像学表现

 Changes of mediastinum position: cause, imaging features.

（二）纵隔的形态改变 Changes of mediastinum shape

五、胸膜的异常影像学征象 Abnormal imaging signs of pleura

（一）胸腔积液 Pleural effusion

影像学表现，根据积液量分类，根据积液部位分类

Imaging features; classification according to effusion volume; classification according to location.

（二）气胸或液气胸 Pneumothorax/hydropneumothorax

 定义，影像学表现 Definition and imaging features.

1. 胸膜增厚、粘连及钙化 Pleural thickening, adhesion and calcification

 影像学表现 Imaging features

1. 胸膜肿块 Pleural mass
2. 横膈的异常影像学征象 Abnormal imaging signs of diaphragm

横膈的形态改变、位置改变、运动改变

Changes of diaphragm shape, position and movement

1. 肺与纵隔病变的影像学诊断

Imaging diagnosis of lung and mediastinal lesions

1. 局限性病变 localized lesions
2. 大叶性肺炎：病理分期，影像学表现

Lobar pneumonia: pathological stage and imaging features.

1. 支气管肺炎：病理改变及影像学表现

Bronchopneumonia: pathology and imaging features.

1. 肺脓肿：病理改变及影像学表现

Pulmonary abscess: pathology and imaging features.

1. 肺结核：分型，各型的病理改变及影像学表现

pulmonary tuberculosis: types; pathology and imaging features of different types.

1. 原发型肺结核 Primary pulmonary tuberculosis

（1）原发综合征 Primary complex

（2）胸内淋巴结结核 Tuberculosis of intrathoracic lymph nodes

1. 血行播散型肺结核 Hemo-disseminated pulmonary tuberculosis
2. 浸润型肺结核 Infiltrative pulmonary tuberculosis
3. 慢性纤维空洞型肺结核 Chronic fibrous cavitary pulmonary tuberculosis
4. 结核性胸膜炎 Tuberculous pleurisy
5. 肺癌 Bronchogenic carcinoma
6. 病理类型：鳞癌、腺癌、小细胞癌、大细胞癌；

Pathological types: squamous carcinoma, adenocarcinoma, small cell carcinoma, and large cell carcinoma.

1. 大体分型：中央型肺癌，周围型肺癌，弥漫型肺癌

Gross types: central bronchogenic carcinoma, peripheral bronchogenic carcinoma and diffuse bronchogenic carcinoma.

1. 中央型肺癌：三阻征象，反“S”征，肿瘤转移征象

Central bronchogenic carcinoma: obstructive signs, adverse “s” sign and metastatic signs

1. 周围型肺癌：毛刺征，胸膜凹陷征、空泡征，肿瘤转移征象，肺上沟癌。

Peripheral bronchogenic carcinoma: spiculation, pleural indentation, vacuole sign and metastatic signs; Pancoast tumor.

1. 弥漫型肺癌 Diffuse bronchogenic carcinoma
2. 肺小结节的人智能辅助诊断。
3. 肺转移瘤：共同特点，各种转移瘤各自的特点

Pulmonary metastases: common characteristic; characteristics of different kinds of metastases

1. 错构瘤：“爆米花”样钙化

Hamartoma: popcorn calcification

1. 纵隔肿瘤 Mediastinal tumor

前纵隔：胸内甲状腺肿，胸腺瘤，畸胎瘤

Anterior mediastinum: intrathoracic goiter, thymoma and teratoma

中纵隔：淋巴瘤，支气管囊肿

Middle mediastinum: lymphoma and bronchogenic cyst.

后纵隔：神经源肿瘤

Posterior mediastinum: neurogenic tumors

1. 胸内甲状腺肿 Intrathoracic goiter
2. 胸腺瘤：常合并重症肌无力 Thymoma: Often combined with myasthenia gravis.
3. 畸胎瘤：脂肪、钙化、骨骼、牙齿

Teratoma: adipose tissue, calcification, skeleton and teeth.

1. 支气管囊肿 Bronchogenic cyst
2. 淋巴瘤 Lymphoma
3. 神经源性肿瘤：脊柱旁，哑铃状

Neurogenic tumors: beside the spine; dumbbell-shaped

（九）胸部外伤：肋骨骨折，气胸及液气胸，肺挫伤，肺撕裂伤及肺血肿，气管和支气管挫伤

 Thoracic trauma: rib fracture, pneumothorax, hydropneumothorax, pulmonary contusion, pulmonary laceration, pulmonary hematoma, trachea and bronchi contusion.

二、肺弥漫性病变 Diffused pulmonary lesion

（一）慢性支气管炎：（自学）chronic bronchitis: (Self-study)

（二）血型播散型肺结核 Hemo-disseminated pulmonary tuberculosis

1. 急性血型播散型肺结核：“三均一”(密度、大小、分布均匀)

 Acute hemo-disseminated pulmonary tuberculosis: homogeneous of density, size and distribution.

2. 亚急性或慢性血型播散型肺结核：“三不均匀”（ 密度、大小、分布不均匀）

 Subacute/chronic hemo-disseminated pulmonary tuberculosis: heterogeneous of density, size and distribution.

（三）特发性肺间质纤维化（自学）Idiopathic pulmonary fibrosis (Self-study)

第四节 影像学检查方法的比较与选择 Comparison and selection of imaging examination methods

 原则：根据病情优选，根据病程优选，根据病变优选，根据病人优选

 Principle: priority selection according to pathological condition, course of disease, types of diseases and patients.

**2、教学基本要求 Basic requirements**

（1）掌握肺与纵隔的正常影像学解剖。

 Master the normal imaging anatomy of lung and mediastinum.

（2）熟悉肺与纵隔病变的异常影像学征象和常见疾病的影像学诊断。

 Be familiar with the abnormal imaging signs of lung and mediastinum, and imaging diagnosis of common diseases.

（3）了解肺与纵隔疾病的影像学检查方法的比较和选择。

 Understand the comparison and selection of imaging examination methods in lung and mediastinum diseases.

**3、重点和难点 Key points and difficult points**

（1）重点：肺炎、结核、支气管肺癌、肺转移瘤、纵隔常见肿瘤的影像表现。

 Key points: the imaging features of pneumonia, tuberculosis, bronchogenic carcinoma, pulmonary metastases and common mediastinal tumors.

（2）难点：良恶性肺结节鉴别，空洞的鉴别诊断。

Difficult points: deferential diagnosis of benign and malignant pulmonary nodules; deferential diagnosis of cavities.

**4、育人元素**

由肺炎引出疫情中英雄事迹及抗疫精神。

From the pneumonia to the outbreak of heroic deeds and the spirit of fighting the epidemic.

**5、周次**

第2-4周

### 第二章 心脏和大血管 Heart and great vessels

**1、教学内容 Teaching contents**

第一节 心脏和大血管的正常影像解剖 Normal imaging anatomy of heart and great vessels

1. X线平片：X-ray plain film

1. 主要介绍后前位及侧位的正常影像解剖，左前斜位、右前斜位

 Mainly introduce the normal anatomy of post-anterior and lateral view; left- and right anterior oblique view.

2. 心脏大血管的大小：心胸比率 Size of cardiovascular: Cardiothoracic ratio.

3. 肺门和肺纹理：Hila and lung markings

二、USG、MRI、CT、心血管造影：简单介绍一些新进展

 USG, MRI, CT and angiography: Brief introduction of some new development.

第二节 心脏和大血管病变的基本影像学征象 Basic imaging signs of heart and great vessel diseases

1. 心脏位置异常 Cardiac malposition
2. 心脏大小异常：心胸比率，重点介绍各房室（左心室、左心房、右心室、右心房）增大的常见疾病及X线表现

Abnormal cardiac size: cardiothoracic ratio. Focus on common diseases that cause enlargement of cardiac chambers and X-ray imaging signs.

1. 肺循环的基本病变和影像学征象

Basic pathological changes and imaging signs of pulmonary circulation.

重点介绍肺少血、肺充血、肺淤血的定义，常见的疾病及X线表现

Focus on definition, common diseases and X-ray imaging signs of pulmonary oligemia, pulmonary congestion and pulmonary passive congestion.

1. 体循环大血管病变的基本影像学征象：简单介绍右位主动脉弓、主动脉扩张、上腔静脉扩张等。

Basic imaging signs of systemic circulation lesion: brief introduction of right aortic arch, aortectasia and Superior vena cava dilatation, et al.

1. 心脏及大血管结构异常的基本影像学征象

Basic imaging signs of abnormal heart and great vessel structure.

简单介绍各种异常的常见疾病（分流性异常、反流性异常、梗阻性异常、心脏和大血管结构连接异常、钙化性异常、心肌、心包和心腔异常）。

Brief introduction of various common diseases (Shunt, reflux, obstruction, connection anomaly of heart and great vessels, calcification, anomaly of cardiac muscle, pericardium and chambers)

第三节 心脏和大血管疾病的影像学诊断

 Imaging diagnosis of cardiovascular diseases.

一、有肺淤血改变的心脏病 Cardiac disease with pulmonary passive congestion.

1. 风湿性心脏病二尖瓣狭窄：重点讲授血流动力学改变和相应的心肺改变：左心房、右心室增大、肺淤血（熟悉或了解）

 Rheumatic heart disease mitral stenosis: focus on hemodynamic changes and X-ray imaging features; enlargement of left atrium and right ventricular; pulmonary passive congestion.

2. 风湿性心脏病二尖瓣关闭不全：简单介绍血流动力学改变相应的心肺改变，常合并二尖瓣狭窄（左心房、右心室、左心室增大、肺淤血）（了解）

Rheumatic heart disease mitral valve insufficiency: Brief introduction of hemodynamic changes and X-ray imaging features; often combined with mitral stenosis (enlargement of left atrium, left ventricular and right ventricular; pulmonary passive congestion.)

二、有肺充血改变的心脏病 Cardiac disease with pulmonary congestion.

1．室间隔缺损：简单介绍其血流动力学改变

 Ventricular septal defect: Brief introduction of the hemodynamic changes.

2. 房间隔缺损：重点讲授血流动力学改变和X线平片表现，右心房、右心室增大、肺充血

 Atrial septal defect (ASD): Focus on the hemodynamic changes and X-ray imaging features; enlargement of right atrium and right ventricular; pulmonary congestion.

三、有肺缺血改变的心脏病 Cardiac disease with pulmonary oligemia.

法洛四联症：肺动脉狭窄、室间隔缺损、主动脉骑跨、右心室肥厚，重点讲授血流动力学改变和X线平片表现。

Tetralogy of fallot: Pulmonary artery stenosis, ventricular septal defect, aortic ride span, right ventricular hypertrophy; focus on hemodynamic changes and X-ray plain film manifestations.

肺栓塞：掌握检查方法，主要征象

1. 肺血基本正常的心脏病 Cardiac disease with normal pulmonary circulation.

冠状动脉硬化性心脏病与心梗：掌握常用影像学检查的选择，熟悉相应的心血管病变有哪些

Coronary arteriosclerotic heart disease: General understanding.

主动脉瘤及主动脉夹层：掌握定义、检查方法及主要征象

1. 心包病变 Pericardial disease

心包炎：重点讲授缩窄性心包炎的影像表现（心包增厚、钙化、心包积液）

Pericarditis: focus on the imaging features of constrictive pericarditis (pericardial thickening, calcification and pericardial effusion)

1. 心脏和大血管疾病影像学检查方法的比较和选择

 Comparison and selection of imaging methods for cardiac and vascular diseases.

X线平片、CT、MR

X-ray plain film, CT and MR.

**2、教学基本要求 Basic requirement**

（1）掌握：心脏与大血管的正常影像学解剖，心脏和大血管病变的基本异常影像学征象。

 Master: Normal imaging anatomy of heart and great vessels; Basic imaging signs of heart and great vessel diseases

（2）熟悉：心脏与大血管常见疾病的影像学诊断：冠心、心梗、肺栓塞、主动脉夹层、法洛氏四联症、房缺、室缺等

Be familiar with diagnosis of heart and great vessel diseases.

（3）了解：心脏与大血管的影像学检查方法的比较和选择。

 Understand the comparison and selection of heart and great vessel examination methods.

**3、重点和难点 Key points and difficult points.**

（1）重点：房间隔缺损、法乐氏四联症、胸痛三联征等常见病影像学表现。

 Key points: Imaging features of ASD, Tetralogy of fallot, mitral stenosis and other common diseases.

（2）难点：肺充血与肺淤血的鉴别。

Difficult points: differential diagnosis ofpulmonary congestion and pulmonary passive congestion.

**4、育人元素**

心血管疾病发病率逐年增高，医学影像学在疾病的预防、早期诊断、疗效评估中发挥着重要作用。

The incidence of cardiovascular diseases is increasing year by year, and medical imaging plays an important role in the prevention, early diagnosis and curative effect evaluation of cardiovascular diseases.

**5、周次**

第5-6周

### 第三章 乳腺 Breast

自学 Self-study

### 第三篇 腹部（教学时数 20学时）Abdomen (20 class hours)

### 第一章 食管和胃肠道 Esophagus and gastrointestinal tract

食管与胃肠道钡剂造影在传统的放射学中占重要地位，CT与MR的发展在胃肠道疾病的诊断发挥越来越重要的作用。

Barium contrast radiography of esophagus and gastrointestinal tract occupies an important position in traditional radiology. Development of CT and MR plays a more and more important role in diagnosis of gastrointestinal diseases.

**1、教学内容 Teaching contents**

第一节 食管和胃肠道的正常影像解剖 Normal imaging anatomy of esophagus and gastrointestinal tract

一、食管：三个生理压迹，两个生理狭窄。

 Esophagus: Three physiological pressure trace and two physiological stenosis.

二、胃：胃的四种类型，不同部位的胃粘膜的特点。

 Stomach: Four types of stomach; Characteristics of gastric mucosa at different locations.

三、十二指肠：分为球部、降段、水平段、升段。

 Duodenum: duodenal bulb, descending segment, horizontal segment, ascending segment.

四、小肠：空肠、回肠的鉴别。

 Small intestine: Identification of jejunum and ileum.

五、大肠：结肠袋、半月皱襞，粘膜分布特点。

 Large intestine: colonic pouch, plica mucosa, distribution characteristics.

第二节 食管和胃肠道病变的基本影像学征象。Basic imaging signs of esophagus and gastrointestinal diseases.

一、管壁改变 Tube wall changes

（一）隆起：重点讲述充盈缺损的定义及影像学表现，常见的疾病。

 Apophysis: Focuses on the definition and imaging manifestations of filling defect; Common diseases.

（二）凹陷：定义，重点讲述龛影的定义及影像学表现，常见的疾病。

 Sunken: Definition; Focuses on the definition and imaging manifestations of niche; Common diseases.

（三）管壁增厚：定义及诊断标准，CT Wall thickening: definition and diagnostic criteria; CT.

（四）管壁僵硬：定义。Wall stiffness: definition.

二、黏膜皱襞改变 Duplicature changes

（一）黏膜皱襞破坏：定义及影像学表现，常见的疾病。

 Destruction of duplicature: Definition and imaging manifestations; Common diseases.

（二）黏膜皱襞平坦：定义及影像学表现，常见的疾病。

 Flat duplicature: Definition and imaging manifestations; Common diseases.

（三）黏膜纠集：定义及影像学表现，常见的疾病。

 Mustering duplicature: Definition and imaging manifestations; Common diseases.

（四）黏膜皱襞增宽和迂曲：定义及影像学表现，常见的疾病。

 Widened and tortuous duplicature: Definition and imaging manifestations; Common diseases.

（五）微黏膜皱襞改变：定义及影像学表现，常见的疾病。

 Micro duplicature change: Definition and imaging manifestations; Common diseases.

三、管腔改变 Lumen changes

（一）管腔狭窄：定义及影像学表现，常见的疾病。

 Lumen stenosis：Definition and imaging manifestations; Common diseases.

（二）管腔扩张：定义及影像学表现，常见的疾病。

 Lumen dilation：Definition and imaging manifestations; Common diseases.

四、位置和移动度改变 Changes in position and mobility

五、管腔外的改变 Changes out of lumen

六、功能性改变 Functional changes

张力改变、蠕动改变、运动力改变（胃小肠排空延迟、动力增强的定义）、分泌功能改变。

Changes of tension, peristalsis, motility (definition of delayed gastrointestinal emptying and enhanced motility) and endocrine.

第三节 食管和胃肠道常见疾病的影像学诊断 Imaging diagnosis of esophagus and gastrointestinal diseases.

一、局限性隆起和凹陷 Localized apophysis and sunken

（一）食管癌 Esophageal carcinoma

1. 早期食管癌：定义、影像学表现

 Early esophageal cancer: definition and imaging features.

2. 中晚期食管癌：管腔狭窄、充盈缺损、腔内龛影、黏膜破坏中断、蠕动消失

 Advanced esophageal cancer: lumen stenosis, filling defect, niche, duplicature destruction and loss of peristalsis.

3. 食管癌的病理分型及相应的影像学表现。Pathological classification and corresponding imaging findings of esophageal carcinoma.

（二）胃十二指肠溃疡 Gastric and duodenal ulcer

1. 胃溃疡：Gastric ulcer

（1）直接征象：龛影，黏膜线征、项圈征、狭颈征。

 Direct sign: niche, mucosal sign, collar sign and narrow neck sign.

（2）间接征象：痉挛切迹，疤痕收缩。

 Indirect sign: spasm notch and scar contraction.

（3）胃溃疡的特殊表现：穿透性溃疡，胼胝性溃疡。

 Special features of gastric ulcer: penetrating ulcer and callous ulcer.

2. 十二指肠溃疡 Duodenal ulcer

（1）直接征象：龛影，球部变形。

 Direct sign: niche and bulb deformity.

（2）间接征象：激惹征，幽门痉挛，胃分泌增多。

 Indirect sign: irritation sign, pylorospasm and increased gastric secretion.

（三）胃癌 Gastric carcinoma

1. 早期胃癌：定义，分型

 Early gastric cancer: definition and classification.

2. 进展期胃癌：分型及影像学表现，胃腔狭窄、充盈缺损、腔内龛影、黏膜破坏中断、蠕动消失，简述CT/MR的表现，重点讲述良性、恶性溃疡的鉴别诊断，简述胃窦癌与胃窦炎的鉴别诊断。

 Advanced gastric cancer: classification and imaging features; stenosis, fill defect, niche, duplicature destruction and loss of peristalsis; brief introduction of CT/MR imaging manifestation; focus on the differential diagnosis of benign and malignant ulcer; briefly introduce the differential diagnosis of gastric antrum cancer and antral gastritis.

（四）十二指肠憩室 Duodenal diverticula

 简述其影像学表现。Brief introduction of imaging features.

（五）结、直肠癌 Colorectal carcinoma

分型，影像学表现（管腔狭窄、充盈缺损、腔内龛影、黏膜破坏中断、蠕动消失）。简述CT/MR在结直肠癌的诊断价值。总结食管癌、胃癌、结直肠癌的共性的表现。

Classification and imaging manifestation (stenosis, fill defect, niche, duplicature destruction and loss of peristalsis); briefly introduce the value of CT/MR in diagnosing colorectal carcinoma. Summarize the common features of esophageal cancer, gastric cancer and colorectal cancer.

（六）结、直肠息肉 Colorectal polyps

结肠气钡双重造影的表现。Manifestation of double contrast barium enema

二、弥漫性病变 Diffused lesion

（一）食管静脉曲张：定义，典型的影像学表现，黏膜迂曲增宽呈蚯蚓状充盈缺损。强调食管癌与食管静脉曲张的鉴别诊断。

 Esophageal varices: definition and typical imaging findings; Tortuous and widened mucosa and earthworm-like filling defect. Emphasis on the differential diagnosis of esophageal carcinoma and esophageal varices.

（二）克罗恩病、肠结核、溃疡性结肠炎：自学 Crohn's disease, intestinal tuberculosis and ulcerative colitis: Self-study.

三、异常扩张 Abnormal dilation

贲门失弛缓症：食管下段-贲门呈鸟嘴样狭窄，狭窄段以上食管明显扩张，第三收缩波。

Achalasia: beaklike stenosis of the lower esophagus and cardia; dilation of the upper esophagus; the third contraction wave.

第四节 食管和胃肠道影像学检查方法的比较和选择 comparison and selection of imaging methods for esophagus and gastrointestinal track examination.

钡剂造影，CT、MR Barium radiography, CT and MR.

**2、教学基本要求 Basic requirement**

（1）掌握：食管和胃肠道有关的正常影像解剖，食管和胃肠道的基本异常影像学征象。

 Master: normal imaging anatomy of esophagus and gastrointestinal tract; basic imaging findings of esophagus and gastrointestinal anomaly.

（2）熟悉：食管和胃肠道常见病的影像学诊断。

 Be familiar with: imaging diagnosis of common esophagus and gastrointestinal diseases.

（3）了解：常见胃肠道疾病的影像学检查方法的比较和选择。

 Understand: comparison and selection of imaging methods for esophagus and gastrointestinal track examination.

**3、重点和难点 Key points difficult points**

（1）重点：食管癌、静脉曲张、胃及十二指肠溃疡、胃癌、结直肠癌等常见病的影像学表现。

 Key points: imaging features of esophageal carcinoma, esophageal varices, gastric and duodenal ulcer, gastric cancer, colorectal cancer and other common diseases.

（2）难点：食管癌与静脉曲张的鉴别诊断，良恶性胃溃疡的鉴别诊断。

 Difficult points: differential diagnosis of esophageal carcinoma and varices; differential diagnosis of benign and malignant gastric ulcer.

**4、育人元素**

消化道疾病严重危险我国人民健康，医学影像学在消化道疾病的早期诊断、术前分期、疗效评估中具有重要价值。

Digestive tract diseases threaten the health of people. Medical imaging plays an important role in the early diagnosis, preoperative staging and curative effect evaluation of digestive tract diseases.

**5、周次**

第7-8周

### 第二章  肝、胆、胰、脾 Liver, gallbladder, pancreas and spleen

**1、教学内容 Teaching contents**

第一节 肝、胆、胰、脾的正常影像解剖 Normal imaging anatomy of liver, gallbladder, pancreas, spleen

检查方法（CT/MR），平扫及增强扫描。简述肝脏、胆道系统、胰腺、脾脏的正常影像学解剖，CT为主，简单介绍MR

Examination methods (CT/MR), plain and enhanced scanning. Briefly introduce the normal imaging anatomy of liver, gallbladder, pancreas and spleen; focus on CT imaging, brief introduction of MR.

第二节 肝脏 Liver

一、肝脏病变的基本影像学征象 Basic imaging signs of liver diseases

（一）形态异常：重点讲述肝硬化引起的肝脏形态改变。

 Morphological anomaly: focus on the morphological change caused by liver cirrhosis.

（二）实质异常 Parenchyma anomaly

1. 局灶性肝实质异常：形态、大小、数目、质地、增强表现及强化演变、病灶周围管道结构异常（门静脉及下腔静脉癌栓）。

 Focal parenchyma anomaly: shape, size, number, texture, enhanced manifestations, enhancement pattern and conduct structure anomaly (tumor thrombus of portal vein and inferior vena cava).

2. 弥漫性肝实质改变：Diffused substantial anomaly

（三）肝内血管异常：简述CTA、DSA的表现

 Intrahepatic vascular anomaly: Brief introduction of CTA, DSA manifestation.

（四）肝内胆管异常：Intrahepatic bile duct anomaly

二、肝脏疾病的影像学诊断 Imaging diagnosis of liver diseases.

（一）实质局灶性疾病 Focal substantial diseases.

1. 海绵状血管瘤：CT典型的强化方式---向心性强化。

 Hepatic cavernous hemangioma: typical CT enhancement pattern—centripetal enhancement.

2. 原发性肝细胞癌：分型，小肝癌的定义，强调肝硬化的背景，CT典型的强化方式---快进快退，肿瘤血管、肿瘤包膜，肿瘤侵犯、转移的表现（门静脉癌栓、肝内子灶），肝硬化、门静脉高压的表现。强调与海绵状血管瘤的鉴别诊断。

 Primary hepatocellular carcinoma: classification; definition of small hepatocellular carcinoma; focus on the cirrhosis background; typical CT enhancement pattern: fast forward and rewind enhancement pattern; tumor vessels, tumor capsule, signs of neoplasm invasiveness and metastasis (portal vein tumor thrombus and intrahepatic nodules), and signs of liver cirrhosis and portal hypertension. Focus on the differential diagnosis of hepatocellular carcinoma and cavernous hemangioma.

3. 肝转移瘤：多发、牛眼征、环形强化。

 Liver metastasis: Multiple, bull eye sign and faint rim-like enhancement.

（二）囊性局灶性疾病 Focal cystic diseases.

1. 肝囊肿：液性密度、边界清楚，无强化。

 Hepatic cyst: liquid density, clear boundary and no enhancement.

2. 肝脓肿：环形强化，双环征、三环征，周围充血反应。

 Hepatic abscess: ring enhancement, double-ring sign, triple-ring sign and peripheral congestive reaction.

（三）弥漫性实质性病变 Diffused substantial diseases.

1. 肝硬化：形态、轮廓异常，门静脉高压。

 Liver cirrhosis: anomaly of shape and outline, portal hypertension.

2. 脂肪肝：简述其肝实质密度减低，低于脾脏。

 Liver steatosis: brief introduction of decreased liver substantial density, lower than spleen.

（四）肝脏外伤：自学。Liver trauma: self-study.

三、肝脏疾病影像学检查方法的比较和选择 Comparison and selection of imaging examination methods of liver diseases

超声、CT、MR，平扫及增强扫描

Ultrasound, CT and MR; plain scan and contrast enhanced scan

第三节 胆道系统 Biliary system

一、胆道系统疾病的基本影像学征象 Basic imaging signs of biliary system

 管（囊）腔大小改变，管（囊）壁改变，管（囊）腔内容物异常。

 Anomaly of duct (gall bladder) size, duct (gall bladder) wall and duct (gall bladder) contents.

二、胆道系统疾病的影像诊断 Imaging diagnosis of biliary system diseases

（一）胆总管囊性扩张症（自学）Cystic dilatation of common bile duct (self-study)

（二）胆石症：胆囊结石与胆管结石，阳性结石与阴性结石。

 Cholelithiasis: Gallbladder and bile duct stones, positive and negative stones.

（三）胆囊炎：Cholecystitis:

1．急性胆囊炎：CT，胆囊增大、囊壁增厚、水肿，合并结石

 Acute cholecystitis: CT, enlarged gallbladder, thickened and edematous wall, combined with stones.

2. 慢性胆囊炎：CT，胆囊萎缩，胆囊壁增厚、钙化，合并结石

 Chronic cholecystitis: CT, atrophy of gallbladder, thickening and calcification of gallbladder wall, combined with stones.

（四）胆管恶性肿瘤（自学）Malignant tumor of bile duct (self-study)

三、胆管系统疾病影像学检查方法的比较和选择

 Comparison and selection of imaging examination methods of biliary system diseases.

 超声、CT、MR Ultrasound, CT and MR.

第四节 胰腺 Pancreas

一、胰腺病变的基本影像学征象 Basic imaging signs of pancreatic diseases.

 简述形态异常、实质异常、胰管异常

 Brief introduction of anomaly of shape, parenchyma and pancreatic duct.

二、胰腺疾病的影像学诊断 Imaging diagnosis of pancreatic diseases.

（一）急性胰腺炎：分型及CT表现，胰腺肿大，胰腺周围渗出

 Acute pancreatitis: classification and CT manifestations: enlarged pancreas and peripheral exudation.

（二）慢性胰腺炎：一般了解，胰腺萎缩、实质钙化、胰管扩张。

 Chronic pancreatitis: general understand; atrophy of pancreas, parenchyma calcification and pancreatic duct dilation.

（三）胰腺癌（自学）Pancreatic carcinoma (self-study)

三、胰腺疾病影像学检查方法的比较和选择 Comparison and selection of imaging examination methods of pancreatic diseases.

 超声、CT、MR，平扫及增强扫描。

Ultrasound, CT and MR; plain scan and contrast enhanced scan.

第五节 脾脏（自学）Spleen (self-study)

**2、教学基本要求 Basics requirements**

（1）掌握：肝脏、胆道系统、胰腺、脾脏的正常影像解剖及基本异常影像学征象。

 Master: normal imaging anatomy and basic abnormal imaging signs of liver, biliary system, pancreas and spleen.

（2）熟悉：肝脏、胆道系统、胰腺常见病、多发病的影像学诊断。

 Be familiar with: imaging diagnosis of common diseases of liver, biliary system and pancreas.

（3）了解：脾脏常见病的影像表现，肝脏、胆道系统、胰腺、脾脏常见病的影像学检查方法的比较和选择。

 Understand: common diseases of spleen; Comparison and selection of imaging examination methods of liver, biliary system, pancreatic and spleen diseases.

**3、重点和难点 Key points and difficult points**

（1）重点：原发性肝细胞癌、海绵状血管瘤、肝硬化、肝脓肿、肝囊肿、急性胰腺炎、胆石症等常见病的影像学表现。

 **Key points:** imaging manifestationprimary hepatocellular carcinoma, cavernous hemangioma, liver cirrhosis, hepatic abscess, hepatic cyst, acute pancreatitis, Cholelithiasis and other common diseases.

（2）难点：原发性肝细胞癌与海绵状血管瘤、肝脓肿的鉴别诊断。

 **Difficult points:** differential diagnosis of primary hepatocellular carcinoma, cavernous hemangioma, and hepatic abscess.

**4、育人元素**

乙肝患者的减少体现了国家对控制传染病的决心。

The decrease in hepatitis B shows the country’s determination to control the epidemic.

**5、周次**

第9周

### 第三章 泌尿系统、肾上腺与腹膜后间隙 Urinary system, adrenal gland and retroperitoneal space.

腹部平片、泌尿系各种造影在传统的放射学有重要作用，但价值不同。CT与MR的发展在泌尿系统，尤其在肾上腺与腹膜后间隙疾病的诊断发挥着重要的作用。

Abdomen plain films and various kinds of contrast radiography in urinary system play an important role in traditional radiology, but have different values. Development of CT and MR plays an important role in urinary system examination, especially in the diagnosis of adrenal gland and retroperitoneal space diseases.

**1、教学内容 Teaching contents.**

第一节 泌尿系的正常影像解剖 Normal imaging anatomy of system examination.

一、肾脏：大小，位置，轴线，形态。肾盂的三种形态。

 Kidney: size, location, axis and shape. Three forms of pelvic.

二、输尿管：位置、形态、行程、三个生理狭窄。

 Ureter: location, shape, route and three physiological stenosis.

三、膀胱：位置，形态，生理压迹。

 Bladder: location, shape and physiological impression.

第二节 泌尿系病变的基本影像学征象 Basic imaging signs of urinary system diseases.

一、位置的异常 Abnormal location

（一）肾脏位置的异常：定义及影像学表现，常见的疾病。

 Abnormal location of kidney: definition, imaging features and common diseases.

（二）输尿管位置的异常：重点讲腔静脉后输尿管的定义及影像学表现。

 Abnormal location of ureter: focus on the definition and imaging features of postcaval ureter.

二、形态与结构的异常 Shape and structure anomaly

（一）集尿系统 Urine collection system

 1.形态异常 Shape anomaly

 （1）肾盂、肾盏形态的异常：破坏、变形、受压移位、扩张积液的影像学表现，常见的疾病。

 Shape anomaly of renal pelvis and calices: imaging features of destruction, distortion, compressive displacement, dilation and effusion; Common diseases.

 （2）输尿管形态的异常：影像学表现，常见的疾病。

 Shape anomaly of ureter: imaging features and common diseases.

 （3）膀胱形态的异常：影像学表现，常见的疾病。

 Shape anomaly of bladder: imaging features and common diseases.

2.结构异常 Structure anomaly

 充盈缺损：定义、影像学表现，常见的疾病。

 Filling defect: definition, imaging manifestation and common diseases.

1. 肾实质的异常 Renal parenchyma anomaly

1.囊性肿块：定义、影像学表现，常见的疾病。

 Cystic mass: definition, imaging manifestation and common diseases.

2.囊实性肿块：定义、影像学表现，常见的疾病。

 Cystic and solid mass: definition, imaging manifestation and common diseases.

3.实性肿块：定义、影像学表现，常见的疾病。

 Solic mass: definition, imaging manifestation and common diseases.

（三）结石与钙化 Calculus and calcification

1.结石 Calculus

（1）结石的类型：阳性结石，阴性结石的概念。

 Types of calculus: definition of positive and negative stones.

（2）肾结石、输尿管结石、膀胱结石的影像学表现。

 Imaging features of calculus of kidney, ureter and bladder.

2.钙化：影像学表现，常见的疾病。Calcification: imaging feature and common diseases.

第三节 泌尿系常见疾病的影像学诊断 Imaging diagnosis of urinary system common diseases.

 一、位置异常 Abnormal location

 异位肾与马蹄肾：定义，影像学表现。

Ectopical kidney and horseshoe kidney: definition and imaging features.

 二、形态与结构的异常 abnormal shape and structure

 （一）泌尿系结核 Urinary tuberculosis

 1.肾脏结核：病理改变，肾实质、肾盂、肾盏受累的影像学表现。

 Renal tuberculosis: pathological changes, imaging features of involvement of renal parenchyma, pelvic and calices.

 2.输尿管结核：病理改变，影像学表现。

 Ureter tuberculosis: pathological changes and imaging features.

 3.膀胱结核：病理改变，影像学表现。定义及诊断标准，CT。

 Bladder tuberculosis: pathological changes and imaging features. Definition and diagnostic criteria, CT.

1. 肾盂癌：定义，影像学表现，造影表现重点讲述充盈缺损。

 Renal pelvic carcinoma: definition and imaging features; focus on introduction of filling defect in radiography.

1. 肾囊肿与多囊肾：影像学表现，造影表现重点讲述肾盂、肾盏受压。

 Renal cyst and polycystic kidney: imaging features; focus on renal pelvis and calices compression in radiography.

（四）肾癌：定义，影像学表现。

 Renal carcinoma: definition and imaging features.

**2、教学基本要求 Basic requirments**

（1）掌握：泌尿系统的正常影像解剖，泌尿系统基本病变的影像学征象。

 Master: normal imaging anatomy and basic imaging signs of urinary system diseases.

（2）熟悉：泌尿系统常见疾病的影像学诊断。

 Be familiar with: imaging diagnosis of urinary system common diseases.

（3）了解：常见泌尿系统疾病的影像学检查方法的比较和选择。

 Understand: comparison and selection of imaging methods of urinary system diseases.

**3、重点与难点 Key points and difficult points**

**重点：**泌尿系结石，结核，肾盂癌，肾癌，肾囊肿与多囊肾等常见疾病的影像表现。

**Key points:** imaging features of urolithiasis, tuberculosis, renal pelvic carcinoma, renal cell carcinoma, renal cyst and polycystic kidney and other common diseases.

**难点: Difficult points:**

① 静脉肾盂造影片：输尿管正常形态与扩张、狭窄的鉴别；肾积液的肾盏表现；肾盂、肾盏破坏，受压、充盈缺损的表现。

Intravenous pyelogram: differential diagnosis of normal shape and dilation/stenosis of ureter; imaging manifestation of hydronephrosis; destruction of renal pelvis and calices, and manifestation of compression and filling defect.

② 肾结石与钙化的鉴别。Differential diagnosis of calculus and calcification.

 ③ CT片：肾实质空洞、脓肿与囊肿、肾盏积液的鉴别；肾盂癌与肾盂血肿的鉴别。肾结核、肾癌的CT诊断。

 CT images: differential diagnosis of renal parenchyma cavity, abscess, renal cyst and renal calices effusion.

 第五节 肾上腺（自学）Adrenal gland (self-study)

 第六节 腹膜后间隙（自学）Retroperitoneal space (self-study)

**4、育人元素**

泌尿系统疾病是临床常见疾病，医学影像学在疾病的诊断、疗效评估中具有重要作用。

Urinary system diseases are common diseases. Medical imaging plays an important role in diagnosis and evaluation of curative effect.

**5、周次**

第14周

### 第四章 生殖系统 Reproductive system

 自学 Self-study

### 第五章 急腹症 Acute abdomen

**1、教学内容 Teaching contents**

第一节 与急腹症有关的正常影像解剖 Normal imaging anatomy related to acute abdomen

腹壁和盆壁（简述胁腹线的定义），实质脏器，空腔脏器

Abdominal and pelvic wall (briefly introduce the definition of flank stripe); solid organs; hollow organs.

第二节 急腹症基本影像学征象 Basic imaging signs of acute abdomen

一、异常气体：简述主要的原因及相应的影像学表现

 Abnormal gas: briefly introduce the main reasons and related imaging signs.

胃肠道内异常气体，肠壁气体，腹腔游离气体。

Abnormal gas in gastrointestinal tract; Intestinal wall gas; free intraperitoneal gas.

二、腹腔积液 Ascites

三、腹腔钙化 Abdominal calcification

四、腹腔内肿块影 Abdominal mass shadow

五、腹腔或腹膜后脓肿 Abdominal or retroperitoneal abscess

六、下胸部异常 inferior thoracic anomaly.

七、骨骼异常 skeleton anomaly

第三节 常见急腹症的影像学诊断 Imaging diagnosis of common acute abdominal diseases

一、肠梗阻 Intestinal obstruction

肠梗阻定性的诊断，肠梗阻分类，肠梗阻的定位诊断

Qualitative diagnosis; classification; localization diagnosis.

（一）肠梗阻的定性诊断 Qualitative diagnosis of intestinal obstruction.

1. 单纯性肠梗阻：腹部立卧位片，重点讲述单纯性肠梗阻的特征性改变----多发液气平面呈阶梯状分布（肠腔气柱渐高征）及其形成机理，串珠征。

 Simple intestinal obstruction: erect and supine position of abdominal plain film; focus on the specific change of simple intestinal obstruction: multiple liquid gas interface with step-like distribution (progressive heightening gas columns sign) and the mechanism; string of beads sign.

2. 绞窄性肠梗阻：重点讲述“假肿瘤征”、“咖啡豆征”的表现。

 Strangulating ileus: focus on the imaging signs of pseudotumor sign and coffee bean sign.

3. 麻痹性肠梗阻：大肠、小肠积气、扩张，以结肠为明显，液气平面少见

 Paralytic ileus: pneumatosis and dilation of large and small intestine, especially colon; liquid gas interface is rare.

（二）肠梗阻的定位诊断 localization diagnosis of intestinal obstruction

根据扩张肠襻的形态和特征及扩张与萎陷肠管的移行区判断

According to the shape and characteristics of dilated intestinal loop, and the transition zone of dilated and collapsed intestine.

1. 肠梗阻的病因诊断 Etiological diagnosis of intestinal obstruction

强调CT的优势 Emphasize the advantages of CT.

二、肠套叠 Intussusception

定义及CT表现，重点讲述空气灌肠在肠套叠诊断和复位的表现及重要意义

Definition and CT imaging features; focus on the manifestation and significance of air enema in diagnosis and restoration of intussusception.

三、胃肠道穿孔 Gastrointestinal perforation

主要的影像学表现：膈下游离气体

Main imaging manifestation: Subdiaphragmatic free air

四、急性阑尾炎 Acute appendicitis

一般了解，简述阑尾粪石的诊断意义，阑尾炎CT改变

General understanding: Diagnostic significance of appendiceal fecalith; CT imaging features of appendicitis.

五、腹部外伤：一般了解 Abdominal trauma: General understanding

第四节 急腹症影像学检查方法的比较和选择 comparison and selection of imaging examination methods for acute abdomen.

腹部立卧位片，CT，超声，血管造影

Erect and supine position of abdominal plain film; CT; ultrasound; angiography.

**2、教学基本要求 Basic requirement**

（1）掌握：与急腹症有关的正常影像解剖。

 Master: Normal imaging anatomy related to acute abdomen.

（2）熟悉：急腹症的基本异常影像学征象及常见急腹症的影像学诊断。

 Be familiar with: Basic imaging signs of acute abdomen; imaging diagnosis of common acute abdominal diseases.

（3）了解：常见急腹症的影像学检查方法的比较和选择。

 Understand: comparison and selection of imaging examination methods for common acute abdomen.

**3、重点和难点 Key points and difficult points**

（1）重点：消化道穿孔、肠梗阻、肠套叠的等常见急腹症的影像学表现。

 Key points: imaging manifestation of perforation of the digestive tract, ileus, Intussusception and other common acute abdomen.

（2）难点：肠梗阻定性诊断。

Difficult points: Qualitative diagnosis of intestinal obstruction.

**4、育人元素**

快速、精准的诊断对急腹症患者的救治至关重要，医学影像学在急腹症患者的诊断中发挥越来越重要的作用。

Rapid and accurate diagnosis is very important for the treatment of patients with acute abdomen, and medical imaging plays an increasingly important role in the diagnosis of patients with acute abdomen.

**5、周次**

第10周

### 第四篇 骨、关节和软组织（教学时数 10学时）Bone, joint and soft tissue (10 class hours)

概述骨关节系统有良好的自然对比条件，X线检查是诊断骨关节病变的重要方法。骨关节的常用X线检查方法。同时介绍CT、MRI对骨关节疾病的诊断价值。

General introduce that bone and joint system has good nature contrast, and X-ray is an important method for bone and joint diseases. Bone and joint examination often choose X-ray imaging. Introduce the value of CT and MRI for diagnosing bone and joint diseases.

### 第一章 骨关节系统总论 General summery of bone and joint system

**1、教学内容 Teaching contents**

第一节 骨关节的正常影像学表现 Normal imaging manifestation of bone and joint.

—、骨关节的正常X线表现 Normal X-ray imaging manifestation of bone and join

1．骨及骨发育的X线表现 X-ray imaging manifestation of bone and bone development

（1）骨的发育和小儿长骨的主要特点，明确生长期长骨干骺端的发育过程(骨骺软骨、二次骨化中心、骨骺板或骨骺线、临时钙化带和干骺端)。

 The main features of bone development and bone in children; explicit the development process of metaphysis in growth period (epiphyseal cartilage, secondary ossification center, the epiphyseal plate or epiphyseal line, temporary calcify and stem epiphyseal end).

（2）成人长骨与生长期长骨的主要区别。The main difference between adult bone and bone in growth period.

2．简述影响骨骼发育的因素(钙磷代谢、维生素的影响)。Briefly introduce the factors that affect bone development.

二、 骨关节的正常CT表现 Normal CT imaging manifestation of bone and joint.

三、 骨关节的正常MRI表现 Normal MRI manifestation of bone and joint.

第二节 骨病变的基本影像学征象及其病理基础 Basic imaging signs and corresponding pathological basis of osseous lesion.

一、骨骼的改变 Skeletal changes

（一）骨密度与信号改变。Density and signal changes of bone.

1．骨破坏：Destruction of bone

（1）定义：Definition

（2）X线、CT、MR表现：Imaging manifestation of X-ray, CT and MR.

（3）骨破坏见于的疾病：Common diseases of bone destruction.

2．异常骨化与钙化：Abnormal ossification and calcification.

（1）骨化：定义，影像学表现。Ossification: definition and imaging feature.

（2）肿瘤骨：定义，影像学表现。Neoplastic bone: definition and imaging feature.

（3）骨质增生硬化：定义，影像学表现。Hyperostosis osteosclerosis: definition and imaging feature.

（4）异常钙化：定义，影像学表现。Abnormal calcification: definition and imaging feature.

3．骨质疏松与骨质软化：Osteoporosis and osteomalacia

（1）骨质疏松：定义，影像学表现，常见的疾病。

Osteoporosis: definition, imaging feature and common diseases.

（2）骨质软化：定义，影像学表现，常见的疾病；假骨折线。

 Osteomalacia: definition, imaging feature and common diseases; pseudo-fracture line.

（3）骨质软化及骨质疏松的鉴别。Differential diagnosis of osteomalacia and osteoporosis.

4．骨坏死：Osteonecrosis

（1）定义：Definition

（2）影像学表现：Imaging manifestation

（二）骨膜反应 periosteal reaction

（1）定义：Definition

（2）影像学表现：Imaging manifestation

（3）骨膜三角 Codman triangle

第三节 骨创伤 Bone trauma

一、骨折的影像学检查与诊断 Imaging examination and diagnosis of fracture.

（一）骨折：定义，影像学检查的注意事项。Fracture: definition and matters need attention in imaging examination.

（二）创伤性骨折 Traumatic fracture

1．骨折线：影像学表现，影像学描述，重点阐明观察骨折的移位要点（对位——内、外、前、后、纵、旋转移位，对线——成角）。

 Fracture line: imaging manifestation, imaging description, emphasis on the key points of observing bone fracture displacement (positional alignment-- medial, lateral, forward, backward, longitudinal, rotational displacement; lineal alignment--angulation).

2．结合常见的骨折（骨骺骨折、青枝骨折、Colles骨折、肱骨髁上骨折、股骨颈骨折、骨盆骨折、前臂骨折）说明其特点

Illustrated the corresponding characteristics of common fractures (epiphyseal fracture, greenstick fracture, Colles’s fracture, supracondylar fracture of the humerus, femur neck fracture, pelvic fracture and forearm fracture).

（三）疲劳骨折：定义，好发部位，影像学表现

 Fatigue fracture: definition, predilection site and imaging manifestation.

（四）病理性骨折：定义 Pathological fracture: definition.

二、骨折的并发症：各种骨折并发症的定义，愈合与不愈合的X线、CT表现。

 Complications of fracture: definition of various kinds of fractures; X-ray and CT imaging features of fracture healing and nonunion.

三、骨折的整复和愈合 Repair and healing of fracture

第四节 骨骼系统疾病的影像学诊断 Imaging diagnosis of skeletal system diseases.

一、单发局灶性骨密度或信号异常 Solitary focal lesion of abnormal bone density or signal.

（一）骨肿瘤与肿瘤样病变 Bone neoplasms and tumor like lesions.

1. 骨肉瘤：重点阐明骨肉瘤引起骨质破坏、骨膜反应、肿瘤骨和软组织肿块的基本X线、CT及MRI表现。

Osteosarcoma: focus on the X-ray, CT and MRI manifestation of bone destruction, periosteal reaction, neoplastic bone and soft tissue mass caused by osteosarcoma.

 2. 骨巨细胞瘤：重点说明良性骨巨细胞瘤的典型X线、CT及MRI表现。

 Giant cell tumor: focus on the typical X-ray, CT and MRI manifestation of benign giant cell tumor.

3. 骨囊肿：重点说明骨囊肿的典型X线、CT及MRI表现

 Bone cyst: focus on the typical X-ray, CT and MRI manifestation of bone cyst.

（二）骨感染 Bone infection

1. 化脓性骨髓炎 Pyogenic osteomyelitis

结合化脓性骨髓炎的病理及病程的特点，阐明急性化脓性骨髓炎及慢性化脓性骨髓炎的X线、CT、MRI表现。

Combined with the characteristics of pathology and disease courses, introduce the X-ray, CT and MRI manifestation of acute and chronic pyogenic osteomyelitis.

2. 骨结核 Bone tuberculosis

结合骨结核的病理特点，概述常见的骨结核X线、CT及MRI表现的共性。阐明不同部位如长骨结核和短状骨结核的影像学表现。

Combined with the characteristics of pathology, generally introduce the X-ray, CT and MRI manifestation of common bone tuberculosis. Explicit the imaging manifestation of different location of bone tuberculosis, for example, long bone tuberculosis and short bone tuberculosis

二、多发局灶性骨密度或信号改变 Multiple focal changes of bone density or signal.

1. 骨转移瘤：影像学表现 Bone metastases: imaging features.

2. 多发性骨髓瘤：临床及影像学表现 Multiple myeloma: Clinical and imaging features.

3. 骨转移瘤与多发性骨髓瘤的鉴别 differential diagnosis of bone metastases and multiple myeloma.

三、全身性骨质改变 Systemic bone changes

（一）骨质疏松：病理及影像学表现。

 Osteoporosis: pathology and imaging findings.

（二）骨软化症和佝偻病：发病机制及影像学表现。

 Osteomalacia and rickets: pathogenesis and imaging findings.

（三）甲状旁腺功能亢进：发病机制及影像学表现。

 Hyperparathyroidism: pathogenesis and imaging findings.

四、骨髓的改变 Changes in bone marrow

（一）白血病：（自学）Leukemia: (Self-study)

五、全身性骨外形改变 Systemic change of bone shape.

（一）肢端肥大症：（自学）Acromegaly: (Self-study)

第五节 常用的影像学检查方法 Common imaging examination methods

一、X线平片 X-ray plain film

二、造影检查 Contrast radiography

1）关节造影 Arthrography

2）血管造影 Angiography

三、CT检查 CT examination

1）平扫 Plain scan

2）增强扫描 Enhancement scan

四、MRI检查 MRI examination

1）平扫 Plain scan

2）增强扫描 Enhancement scan

五、DSA检查 DSA examination

**2、教学基本要求 Basic requirement**

（1）掌握：骨病变的基本X线、CT、MRI表现；重点掌握骨折、骨结核、骨巨细胞瘤、骨肉瘤的典型X线、CT、MRI表现。

 Master: basic X-ray, CT and MR imaging manifestations of bone lesion; focus on the typical X-ray, CT and MR imaging manifestations of fracture, bone tuberculosis, Giant cell tumor and osteosarcoma.

（2）熟悉：骨关节的正常X线、CT、MRI表现；良、恶性骨肿瘤的鉴别要点。

 Be familiar with: normal X-ray, CT and MR imaging manifestations of bone and joints. Differential diagnosis of benign and malignant bone tumors.

（3）了解：骨关节的X线、CT和MRI检查方法的选择及价值。

 Understand: selection and values of X-ray, CT and MR imaging methods of bones and joins.

**3、重点与难点 Key points and difficult points**

 重点：理解骨关节基本病变的X线、CT、MRI表现及其病理基础；将不同的骨关节基本病变运用到临床实践中分析具体的骨关节疾病的影像学表现

 Key points: understand the X-ray, CT and MR imaging features and pathological basis of osteoarticular diseases; bring various kinds of osteoarticular diseases into clinical practices and analyze the imaging features of specific osteoarticular diseases.

 难点：骨骼系统常见病、多发病的影像学诊断与鉴别诊断，骨质疏松与骨质软化的鉴别，骨髓瘤与转移瘤的鉴别。

 Difficult points: imaging diagnosis and differential diagnosis of the common diseases of skeletal system; differential diagnosis of osteoporosis and osteomalacia; differential diagnosis of myeloma and metastasis.

**4、育人元素**

临床-影像-病理三结合对骨肿瘤诊断的重要性，体现了团队合作精神，提高了诊断的准确性。

The importance of the combination of clinical, imaging and pathology in the diagnosis of bone tumors reflects the teamwork spirit and improves the accuracy of diagnosis.

**5、周次**

第11周、第12周

### 第二章 脊柱 Spine

**1、教学内容 Teaching contents**

第一节 脊柱的正常影像解剖 normal imaging anatomy of spine

一、X线平片 X-ray plain film

二、CT CT examination

三、MRI MRI examination

第二节 脊柱病变的基本影像学征象 Basic imaging signs of spinal diseases.

一、椎体的形态与结构异常：塌陷变扁、边缘凹陷、形态异常

 Abnormal morphology and structure of the vertebral bodies: collapse, marginal sunken and abnormal shape.

二、椎体的密度或信号异常：密度增高、密度减低、信号异常

 Abnormal density or signal of the vertebral bodies: increased density, decreased density and signal anomaly.

三、椎间盘（隙）异常：椎间盘密度异常、椎间盘信号异常、椎间隙狭窄

 Intervertebral disc (intervertebral space) anomalies: disc density anomaly, disc signal abnormalities and intervertebral space stenosis.

四、椎弓根的异常：骨质破坏、间隙增宽 Pedicle abnormalities: bone destruction, gap broadening.

五、椎旁软组织的改变 Changes of the soft tissue around the vertebral body

第三节 脊柱基本的影像学诊断 Imaging diagnosis of the spine

一、脊柱局限性骨质密度或信号异常 localized spinal bone density or signal abnormalities.

（一）脊柱结核：X线、CT、MRI表现（骨质破坏、椎间隙变窄或消失、椎旁脓肿）。

 Spinal tuberculosis: imaging findings of X-ray, CT, and MRI (bone destruction, intervertebral space narrowing or disappearance, paravertebral abscess)

（二）脊柱转移瘤：溶骨型转移瘤及成骨型转移瘤的X线、CT、MR表现，脊柱结核与脊柱转移瘤的鉴别要点。

 Spinal metastasis: X-ray, CT, and MR imaging findings of osteolytic bone metastasis and osteogenic bone metastasis; differential diagnosis of spinal tuberculosis and spinal metastases.

二、椎间盘病变 Intervertebral disc disorder

（一）椎间盘退行性改变 Degenerative changes of intervertebral disc.

（二）椎间盘突出：病理及影像学改变 Disc herniation: pathology and imaging findings.

三、脊柱外形的改变 Changes of spine shape

（一）脊柱滑脱：真性滑脱、假性滑脱的定义及影像学表现

 Spondylolisthesis: true spondylolisthesis, definition and imaging findings of pseudo-spondylolisthesis.

（二）强直性脊柱炎：病理改变与影像学表现

 Ankylosing spondylitis: pathological changes and imaging findings.

（三）脊柱创伤：脊柱骨折的影像学表现

 Spine trauma: imaging findings of spinal fractures.

第四节 脊柱疾病影像学检查方法的比较和选择 Comparison and selection of imaging methods for spinal diseases.

X线、CT、MR的优缺点 Advantages and disadvantages of X-ray, CT, and MR.

**2、教学基本要求 Basic requirements**

（1）掌握：脊柱病变的基本X线、CT、MRI表现。

 Master: basic X-ray, CT, and MR imaging findings of spinal diseases.

（2）熟悉：脊柱常见病变的影像学诊断。

 Be familiar with: imaging diagnosis of common spinal diseases.

（3）了解：正常脊柱影像解剖及常见脊柱的正常变异；脊柱影像学检查方法（X线、CT和MRI）的选择及价值。

 Understand: Normal anatomy and common variation of the spine; selection and values of imaging methods for spinal diseases (X-ray, CT, and MRI).

**3、重点与难点 Key points and difficult points**

 重点：理解脊柱基本病变的X线、CT、MRI表现及其病理基础；将不同的基本病变运用到临床实践中分析具体的脊柱疾病的影像学表现

 Key points: understand the X-ray, CT and MR imaging features and pathological basis of spinal diseases; bring different kinds of diseases into clinical practices and analyze the imaging features of specific spinal diseases.

 难点：脊柱常见病、多发病的影像学诊断与鉴别诊断，脊柱结核与转移瘤的鉴别。

 Difficult points: imaging diagnosis and differential diagnosis of the common diseases of the spine; differential diagnosis of spinal tuberculosis and metastasis.

**4、育人元素**

脊柱疾病是临床常见病，医学影像学为脊柱病变评估提供重要的参考依据。

Spinal disease are common diseases, and medical imaging provides an important reference for the evaluation of spinal disease.

**5、周次**

第12周

### 第三章 关节 Joints

**1、教学内容 Teaching contents**

第一节 关节的正常影像解剖 Normal anatomy of joints

 X线、CT、MR，关节囊、关节骨端、骨性关节面及关节间隙，生长期关节的影像解剖特点。

 X-ray, CT and MR; Joint capsule, joint bone end, bony articular surface and joint space; imaging anatomy of the joints in the growing period.

第二节 关节病变的基本影像学征象 Basic imaging signs of arthropathy

（一）关节肿胀：以膝关节为例，观察关节周围软组织肿胀与关节囊肿胀。

 Arthroncus: take the knee joint as an example to observe the swelling of the soft tissue around the joint and the joint capsule.

（二）关节间隙异常：Joint space anomaly

（三）关节软骨下骨吸收及骨性关节面下骨吸收

Bone absorption under articular cartilage and bone absorption under bony articular surface.

（四）关节破坏：以关节结核为例，说明关节破坏的过程和X线表现。

 Joint destruction: take joint tuberculosis as an example to demonstrate the process of joint destruction and X-ray manifestations.

（五）骨性关节面下囊状变：Cystic lesion under bony articular surface.

（六）关节骨质增生硬化及骨赘 Joint hyperostosis osteosclerosis and osteophyte.

（七）关节强直：以慢胜化脓性关节炎或类风湿性关节炎为例，说明骨性强直的X线表现，纤维性强直仅从理论上简要地提一提。

 Ankylosis: take chronic suppurative arthritis or rheumatoid arthritis as an example, to introduce the X-ray manifestations of bony ankylosis, and briefly provided a mention on the fibrous ankylosis.

（八）关节脱位：Dearticulation

（九）关节内游离体：Corpusculum articulare mobile

（十）关节旁软组织肿块：Para-articular soft tissue masses

第三节 关节疾病的影像学诊断 Imaging diagnosis of Joint diseases.

一、关节骨质破坏 Joint destruction

（一）化脓性关节炎 Suppurative arthritis

结合化脓性关节炎的病理改变，说明早期关节肿胀、关节间隙迅速变窄、关节支重面广泛而分散的破坏、慢性期以骨质增生为主，并发关节骨性强直，是化脓性关节炎影像学表现的主要特点。

Integrate the pathological change of suppurative arthritis, introduce that in the early stage, joint swelling, joint space narrowing rapidly, wide and scattered damage of joint bearing surface; and in the chronic stage, osteoproliferation and concurrent joint ankylosis are main imaging features of suppurative arthritis.

（二）关节结核 Joint tuberculosis

滑膜型、骨型。主要特点：骨质疏松、关节间隙变窄、边缘性骨质吸收、周围肌肉萎缩、冷脓肿、纤维强直。与化脓性关节炎相鉴别。

Synovial type and bone type; main features: osteoporosis, joint space narrowing, marginal bone resorption, muscle atrophy, cold abscess and fibrous ankylosis; differential diagnosis of joint tuberculosis and suppurative arthritis.

（三）类风湿性关节炎 Rheumatoid arthritis

了解类风湿性关节炎的X线、CT及MRI表现

Understand the X-ray, CT and MR imaging findings of rheumatoid arthritis.

二、关节骨质增生和骨赘 Joint hyperostosis osteosclerosis and osteophyte.

（一）退行性骨关节病 Degenerative osteoarthropathy

以膝关节为例说明退行性变的X线表现及其病理基础。

Take the knee joint as an example to explain the X-ray manifestations and pathological basis of the degenerative changes.

三、关节脱位 Dearticulation

 以髋关节和肘关节为例，阐明关节脱位的原因和X线、CT及MRI表现。

 Take the hip joint and elbow joint as examples to elucidate the causes and X-ray, CT and MRI manifestations of joint dislocation.

四、关节旁软组织肿块 Para-articular soft tissue masses

了解滑膜肉瘤、色素沉着绒毛结节性滑膜炎、滑膜骨软骨瘤病的影像学改变

Understand the imaging features of synovial sarcoma, pigmented villonodular synovitis and synovial osteochondromatosis.

五、半月板与肌腱韧带损伤 Meniscus and tendon ligament injury

自学 Self-study

第四节 关节疾病影像学检查方法的比较和选择 Comparison and selection of imaging methods of joint diseases.

X线、CT、MRI X-ray, CT and MRI

**2、教学基本要求 Basic requirements**

（1）掌握：关节病变的基本X线、CT、MRI表现。

 Master: basic X-ray, CT and MRI findings of joint diseases.

（2）熟悉：关节的正常影像解剖，关节常见病变的影像学诊断。

 Be familiar with: normal imaging anatomy of joints; imaging diagnosis of common joint diseases.

（3）了解：关节影像学检查方法（X线、CT和MRI）的选择及价值。

 Understand: selection and values of imaging methods for joint diseases (X-ray, CT and MRI).

**3、重点与难点 Key points and difficult points**

 重点：理解关节基本病变的X线、CT、MRI表现及其病理基础；将不同的基本病变运用到临床实践中分析具体的关节疾病的影像学表现

Key points: understand the X-ray, CT and MR imaging features and pathological basis of joint diseases; bring different kinds of diseases into clinical practices and analyze the imaging features of specific joint diseases.

 难点：关节常见病、多发病的影像学诊断与鉴别诊断，化脓性关节炎与关节结核的鉴别。

Difficult points: imaging diagnosis and differential diagnosis of the common diseases of the joints; differential diagnosis of joint tuberculosis and suppurative arthritis.

**4、育人元素**

关节疾病是临床常见病，医学影像学为关节病变评估提供重要的参考依据。

Joint disease is a common disease, and medical imaging provides an important reference for the evaluation of joint disease.

**5、周次**

第13周

### 第四章 软组织 Soft tissue

**1、教学内容 Teaching contents**

第一节 软组织的正常影像解剖 Normal imaging anatomy of soft tissue

X线平片、CT、MR X-ray, CT and MR

第二节 软组织病变的基本影像学征象 Basic imaging signs of soft tissue lesions

一、软组织的钙化与骨化 Calcification and ossification of soft tissue

二、软组织肿块：神经鞘瘤 Soft tissue mass: schwannoma

三、脂肪密度或信号影：了解脂肪瘤、脂肪肉瘤 Fat density or signal intensity: Understand lipoma and liposarcoma

四、软组织内气体 Soft tissue gas

五、软组织肿胀 soft tissue swelling

第三节 软组织疾病影像学检查方法的比较和选择 Comparison and selection of imaging methods of soft tissue diseases.

X线、CT、MRI

X-ray, CT and MRI

**2、教学基本要求 Basic requirements**

（1）掌握：软组织病变的基本X线、CT、MRI表现。

 Master: basic X-ray, CT and MRI findings of soft tissue diseases.

（2）熟悉：软组织的正常影像解剖，软组织常见病变的影像学诊断。

 Be familiar with: normal imaging anatomy of soft tissue; imaging diagnosis of common soft tissue diseases.

（3）了解：软组织的影像学检查方法（X线、CT和MRI）的选择及价值。

 Understand: selection and values of imaging methods for soft tissue diseases (X-ray, CT and MRI).

**3、重点与难点 Key points and difficult points**

 重点：理解软组织基本病变的X线、CT、MRI表现及其病理基础；将不同的基本病变运用到临床实践中分析具体的软组织疾病的影像学表现

Key points: understand the X-ray, CT and MR imaging features and pathological basis of soft tissue diseases; bring different kinds of diseases into clinical practices and analyze the imaging features of specific soft tissue diseases.

 难点：软组织常见病、多发病的影像学诊断与鉴别诊断。

Difficult points: imaging diagnosis and differential diagnosis of the common diseases of soft tissue.

**4、育人元素**

关节疾病是临床常见病，医学影像学为关节病变评估提供重要的参考依据。

Joint disease is a common disease, and medical imaging provides an important reference for the evaluation of joint disease.

**5、周次**

第13周

### 第五篇 中枢神经系统和头颈部（教学时数 4学时） Central nervous system and head and neck (4 class hours)

### 第一章 脑 Brain

**1、教学内容 Teaching contents**

第一节 脑的正常影像解剖 Normal imaging anatomy of brain

CT/MR解剖，脑膜、脑、脑血管、脑室、蛛网膜下腔及脑池

CT/MR anatomy; meninges, cerebrum, cerebral blood vessel, cerebral ventricle, subarachnoid space and cerebral cistern.

第二节 颅脑病变的基本影像学征象 Basic imaging signs of craniocerebral diseases

1. 脑内外病变定位征 Intracephalic and extracephalic diseases.
2. 脑积水：定义、分型 Hydrocephalus: definition and classification.
3. 脑萎缩：定义 Brain atrophy: definition
4. 坏死与囊变：Necrosis and cystic degeneration
5. 钙化：生理性及病理性。Calcification: physiological and pathological calcification.
6. 占位征：影像学表现。Occupying sign: imaging findings

第三节 颅脑基本的影像学诊断 Imaging diagnosis of craniocerebral diseases.

1. 脑内病变 Intracerebral lesions
2. 脑内肿瘤 Intracerebral tumors

星形细胞瘤：CT/MR表现，肿块、占位效应，平扫及增强扫描。

Astrocytoma: CT/MR features, mass, space occupying effect, plain scan and enhanced scan.

1. 脑血管疾病 Cerebrovascular disease
2. 高血压脑出血：CT及MR表现 Hypertensive intracerebral hemorrhage: CT and MR findings
3. 脑梗死：CT及MR表现，MRA Cerebral infarction: CT and MR manifestations; MRA

（三）炎症性疾病 Inflammatory disease

脑脓肿：不同分期的CT及MR表现，平扫及增强扫描。

Brain abscess: CT and MR manifestations of different stages, plain scan and enhanced scan.

（四）脱髓鞘疾病（自学）Demyelinating disease (self-study)

二、脑外病变 Extracerebral tumors

（一）脑外肿瘤 Extracerebral tumors

1. 垂体瘤：最常见的脑外肿瘤，鞍区、鞍上，“8”字征。

 Pituitary tumors: the most common extracerebral tumor; saddle area, suprasellar cistern, the "8" sign.

2. 听神经瘤：桥脑小脑角区肿块，听神经增粗、内听道扩大。

 Acoustic neuroma: tumor located in cerebellopontine angle, with auditory nerve thickening, internal auditory canal enlargement.

（二）颅脑外伤 Craniocerebral trauma

1. 硬膜外血肿：CT梭形高密度影，颅骨骨折，占位效应，脑实质水肿。

 Epidural hematoma: CT demonstrates spindle shaped high density shadow, skull fracture, occupying effect, brain parenchyma edema.

2. 硬膜下血肿：CT新月形高密度影。

 Subdural hematoma: CT demonstrates crescent shaped high density shadow.

第四节 颅脑疾病影像学检查方法的比较和选择 Comparison and selection of imaging methods of craniocerebral diseases.

头颅X线平片，脑血管造影，脑CT，颅脑MRI

X-ray plain film of head, cerebral angiography, brain CT and MRI

**2、教学基本要求 Basic requirements**

（1）掌握：脑影像学解剖，颅脑病变的基本影像学征象。

 Master: imaging anatomy of brain; basic imaging signs of craniocerebral diseases.

（2）熟悉：颅脑常见病和多发病的影像学表现。

 Be familiar with: imaging features of common craniocerebral diseases.

（3）了解：颅脑基本的影像学检查方法（X线、CT和MRI）的比较及选择。

 Understand: selection and values of imaging methods for craniocerebral diseases (X-ray, CT and MRI).

**3、重点与难点 Key points and difficult points**

 重点：脑梗塞、脑出血、星形细胞瘤、垂体瘤、听神经瘤、硬膜下出血、硬膜外出血等常见病的影像学表现。

 Key points: Imaging features of cerebral infarction, cerebral hemorrhage, astrocytoma, pituitary tumor, acoustic neuroma, subdural hemorrhage, epidural bleeding and other common diseases.

 难点：脑梗塞与肿瘤的鉴别诊断，硬膜下出血与硬膜外出血的鉴别诊断。

 Difficult points: Differential diagnosis between cerebral infarction and tumor, subdural hemorrhage and epidural hemorrhage.

**4、育人元素**

介绍健康中国2030规划纲要的相关内容，指出国家对卫生健康领域的重视，强调神经解剖在医学教育的重要性。

Introduce the relevant contents of the Healthy China 2030 Plan, and point out that the state attaches great importance to the field of health, and emphasis the importance of neuroanatomy in medical education.

**5、周次**

第15周

### 第二章 脊髓（自学） Medulla spinalis (self-study)

### 第三章 头颈部（自学）Head and neck (self-study)

### 第六篇 介入放射学 （2学时） Interventional radiology (2 class hours)

### 第一章 中枢和头颈部 Central nervous system and head and neck

1、**教学内容 Teaching contents**

第一节 急性脑梗塞动脉内溶栓治疗 Intra-arterial thrombolytic therapy for acute cerebral infarction.

第二节 颅内动脉瘤介入栓塞术 Interventional embolization of intracranial aneurysms.

第三节 脑动静脉畸形介入栓塞术 Interventional embolization of cerebral arteriovenous malformations.

**2、教学基本要求 Basic requirements**

1.了解中枢和头部疾病介入治疗的适应证和禁忌症、疗效和并发症。

Understand interventional treatment indications and contraindications, efficacy and complications of central nervous system and head disease.

2.掌握急性脑梗塞、颅内动脉瘤及脑动静脉畸形的介入治疗方法。

 Master the interventional treatment of acute cerebral infarction, intracranial aneurysm and cerebral arteriovenous malformation.

3.了解鼻出血的介入治疗方法。Understand the interventional treatment for nasal bleeding.

**3、重点与难点**

掌握急性脑梗塞、颅内动脉瘤及脑动静脉畸形的介入治疗方法

The interventional treatment of acute cerebral infarction, intracranial aneurysm and cerebral arteriovenous malformation

**4、育人元素**

介入放射学的发展大大拓展了疾病微创治疗的适应证，为患者健康保驾护航。

The development of interventional radiology has greatly expanded the indications of minimally invasive treatment of diseases and protected the health of patients.

**5、周次**

第11周

### 第二章 呼吸系统 Respiratory system

**1、教学内容 Teaching contents**

第一节 大咯血介入栓塞治疗 Interventional embolization for massive hemoptysis.

第二节 肺栓塞介入治疗 Interventional treatment of pulmonary embolism.

第三节 支气管肺癌介入治疗 Interventional treatment of bronchogenic carcinoma.

第四节 气管、支气管支架放置术 Trachea and bronchial stent placement

**2、教学基本要求 Basic requirements**

1.了解呼吸系统疾病介入治疗的适应证和禁忌症、疗效和并发症。

 Understand interventional treatment indications and contraindications, efficacy and complications of respiratory system diseases.

2.掌握大咯血、支气管肺癌介入治疗方法。

Master the interventional treatment method massive hemoptysis for bronchial lung cancer.

3.了解肺栓塞介入治疗，气管、支气管支架放置术的基本概念。

Understand the basic concepts of interventional treatment of pulmonary embolism, and trachea and bronchial stent placement.

**3、重点与难点**

大咯血、支气管肺癌介入治疗方法。

The interventional treatment method massive hemoptysis for bronchial lung cancer**.**

**4、育人元素**

介入医学在咯血的微创治疗中发挥重要作用。

Interventional medicine plays an important role in minimally invasive treatment of hemoptysis**.**

**5、周次**

第11周

### 第三章 循环系统 Circulatory system

**1、教学内容 Teaching contents**

第一节 心脏瓣膜成形术 Cardiac valvuloplasty

第二节 先天性心脏病介入治疗 Interventional treatment of congenital heart disease

第三节 冠状动脉病变介入治疗 Interventional treatment of coronary artery disease

第四节 外周动脉狭窄和闭塞介入治疗 Interventional treatment of peripheral artery stenosis and occlusion

**2、教学基本要求 Basic requirements**

1.了解循环系统疾病介入治疗的适应证和禁忌症、疗效和并发症。

 Understand the interventional treatment indications and contraindications, curative effect and complications of circulatory system disease.

2.掌握冠状动脉内溶栓、冠状动脉成形术的介入治疗方法。

 Master the interventional treatment of coronary artery thrombolysis and coronary angioplasty.

3.了解心脏瓣膜成形术和先天性心脏病的介入治疗。

 Understand cardiac valvuloplasty and the interventional therapy for congenital heart disease.

**3、重点与难点**

冠状动脉内溶栓、冠状动脉成形术的介入治疗方法。

The interventional treatment of coronary artery thrombolysis and coronary angioplasty.

 **4、育人元素**

新型支架的应用体现了创新精神。

The application of the new stent reflects the spirit of innovation.

**5、周次**

第11周

### 第四章 消化系统 Alimentary system

**1、教学内容 Teaching contents**

第一节 消化道出血介入治疗 Interventional treatment of digestive tract hemorrhage.

第二节 肝癌经导管动脉化疗栓塞 Transcatheter arterial chemoembolization for hepatocellular carcinoma.

第三节 经颈经脉肝内门体支架分流术 Transjugular intrahepatic portosystemic stent shunt channels.

第四节 腹腔囊肿穿刺引流术 Puncture and drainage of abdominal cyst.

第五节 腹腔脓肿穿刺引流术 Puncture and drainage of abdominal abscess.

第六节 食道狭窄扩张术和支架放置术 Esophageal stricture dilation and stent placement.

第七节 脾动脉栓塞治疗 Splenic artery embolization.

第八节 梗阻性黄疸介入治疗 Interventional treatment of obstructive jaundice.

第九节 胆系残留结石介入治疗 Interventional treatment of biliary residual stones.

第十节 经皮腹腔神经丛阻滞术 Percutaneous celiac plexus block.

**2、教学基本要求 Basic requirements**

1.了解消化系统病变介入治疗的适应证和禁忌症、疗效和并发症。

Understand the interventional treatment indications, contraindications, curative effect and complications of digestive system diseases.

2.掌握消化系统出血、肝癌的介入治疗方法。

 Master the interventional treatment method for digestive system hemorrhage and liver cancer.

3.了解腹腔囊肿和脓肿穿刺引流术、食管狭窄扩张术和支撑器放置、胆系介入治疗的方法。

 Understand the methods of abdominal cyst and abscess puncture drainage, esophageal stricture dilation and the support device placement, and interventional therapy of biliary system.

**3、重点与难点**

消化系统出血、肝癌的介入治疗方法。

The interventional treatment method for digestive system hemorrhage and liver cancer.

 **4、育人元素**

新诊疗手段体现了创新精神。

The new treatment embodies the spirit of innovation.

**5、周次**

第11周

### 第五章 泌尿系统 Urinary system

**1、教学内容 Teaching contents**

第一节 肾动脉成形术和支架放置术 Renal artery angioplasty and stent placement

第二节 经皮穿刺尿路引流 Percutaneous urinary drainage

第三节 前列腺肥大介入治疗 Prostatic hypertrophy interventional therapy

第四节 肾癌介入栓塞治疗 Interventional embolization of renal cell carcinoma

**2、教学基本要求 Basic requirements**

1.了解泌尿系统疾病介入治疗的适应症和禁忌症、疗效和并发症。

Understand the interventional treatment indications, contraindications, curative effect and complications of urinary system diseases.

2.掌握肾动脉成形术和支架放置术的介入治疗方法。

Master the interventional treatment of renal artery angioplasty and stent placement

3.了解肾癌的介入栓塞治疗、前列腺肥大的介入治疗方法。

Understand the interventional therapy of renal cell carcinoma and prostatic hypertrophy.

**3、重点与难点**

肾动脉成形术和支架放置术的介入治疗方法。

The interventional treatment of renal artery angioplasty and stent placement.

 **4、育人元素**

肾动脉成形术和支架放置术的介入治疗方法。

The interventional treatment of renal artery angioplasty and stent placement.

**5、周次**

第11周

### 第六章 盆腔介入治疗 Pelvic interventional therapy

**1、教学内容 Teaching contents**

第一节 盆腔大出血介入栓塞治疗 Interventional embolization treatment of massive pelvic hemorrhage

第二节 子宫肌瘤介入栓塞治疗 Interventional embolization of uterine fibroids

第三节 输卵管再通术 Fallopian tube recanalization

**2、教学基本要求 Basic requirements**

1.了解盆腔疾病介入治疗的适应证和禁忌症、疗效和并发症。

Understand the interventional treatment indications, contraindications, curative effect and complications of pelvic disease.

2.掌握盆腔大出血、子宫肌瘤介入治疗方法。

Master the interventional treatment of pelvic hemorrhage and uterine fibroids.

3.了解输卵管再通术的介入治疗方法。

 Understand the interventional therapy of fallopian tube recanalization.

**3、重点与难点**

盆腔大出血、子宫肌瘤介入治疗方法。

The interventional treatment of pelvic hemorrhage and uterine fibroids.

 **4、育人元素**

介入治疗在盆腔疾病的微创治疗中发挥重要作用。

Interventional therapy plays an important role in minimally invasive treatment of pelvic diseases.

**5、周次**

第11周

### 第七章 骨骼、肌肉系统 Musculoskeletal system

**1、教学内容 Teaching contents**

第一节 股骨头缺血性坏死介入治疗 Interventional treatment of avascular necrosis of the femoral head

第二节 经皮穿刺腰椎间盘切割术和腰椎间盘溶解术 Percutaneous lumbar intervertebral disc cutting and lumbar intervertebral disc dissolution

**2、教学基本要求 Basic requirements**

了解股骨头缺血性坏死、腰椎间盘突出的介入治疗方法。

Understand the interventional treatment of femoral head necrosis and lumbar disc herniation.

**3、重点与难点**

股骨头缺血性坏死、腰椎间盘突出的介入治疗方法。

The interventional treatment of femoral head necrosis and lumbar disc herniation.

 **4、育人元素**

股骨头缺血性坏死、腰椎间盘突出的介入治疗方法。

The interventional treatment of femoral head necrosis and lumbar disc herniation.

**5、周次**

第11周

### 第七篇 超声医学（教学时数 12学时）Ultrasonic Medicine（12 class hours）

### 第一章 超声诊断学基础Basis of Ultrasonic Diagnostics

**1、教学内容 Teaching contents**

第一节 超声医学的概述Introduction of Ultrasonic Medicine

第二节 超声波的物理特性Physical Characteristics of Ultrasound

掌握分辨率，穿透率与波长及频率的关系

Master the relationship between resolution, penetrance, wave length and frequency

第三节 超声波的产生及超声成像的基本原理Generation of Ultrasound and Basic Principle of Ultrasonography

第四节 超声诊断的技术原理Technical Principle of Ultrasonic Diagnosis

各种超声诊断仪的性能、图像特点及临床应用。

Performance, image property and clinical application of ultrasonography instrument

第五节 超声诊断新技术介绍Introduction of New Technique

**2、教学基本要求 Basic requirements**

（1）掌握：超声诊断的临床应用基础， 超声分辨率，穿透力与波长及频率的关系。

Master the clinical application basis of ultrasonic diagnosis, the relationship between ultrasonic resolution, penetration and wavelength and frequency.

（2）熟悉：超声成像的基本原理，超声诊断的技术原理

Familiar with the basic principles of ultrasonic imaging and the technical principles of ultrasonic diagnosis

（3）了解：超声波的基本概念与物理特性，超声新技术在临床的应用及意义，各种超声诊断仪的性能、图像特点及临床应用。

Understand the basic concept and physical characteristics of ultrasound, the clinical application and significance of new ultrasonic technology, the performance, image characteristics and clinical application of various ultrasonic diagnostic instruments.

**3、重点与难点**

（1）重点：二维实时灰阶断面成像原理及声像特点，彩色多普勒血流图及频谱图的成像原理及图像特点，M型超声心动图原理及特点，人体不同组织成分的声像图表现，超声声像图主要观察内容及分析方法，超声诊断的局限性。

principle and characteristics of two-dimension real-time gray-scale image, principle and characteristics of color Doppler flow and spectral image, principle and characteristics of M-mode echocardiography, ultrasonic feature of different tissue component, main observation content of ultrasonography, limitation of ultrasonic diagnosis.

（2）难点：人体不同组织成分的声像图表现，超声声像图主要观察内容及分析方法，囊实性、良恶性病灶的声像图对比，超声伪像的识别与利用.

Ultrasonic feature of different tissue component, main observation content of ultrasonography, comparison between cystic and solid, benign and malignant lesions, identify and utilization of ultrasonic artifacts.

 **4、育人元素**

作为无创、简便、无电离辐射的检查方法，超声检查在疾病筛查及评估中发挥重要作用。

As a noninvasive, simple and ionizing radiation-free examination method, ultrasonography plays an important role in disease screening and evaluation.

**5、周次**

第16周

###  第二章 腹部疾病超声诊断 Ultrasonic Diagnosis of Abdominal Diseases

**1、教学内容 Teaching contents**

1. 正常肝脏、胆囊及肝内外胆管、胰腺、脾脏及肾脏解剖及声像图特点

Anatomic and sonographic characteristics of the normal liver, gallbladder, Intrahepatic and extrahepatic bile duct, pancreas, spleen and kidneys

第二节 肝脏疾病超声诊断 Ultrasonic diagnosis of liver diseases

一、肝脏弥漫性疾病的超声诊断 Ultrasonic diagnosis of diffuse liver diseases

二、肝脏囊性局灶性疾病的超声诊断 Ultrasonic diagnosis of cystic focal liver lesions

三、肝脏实性局灶性疾病的超声诊断 Ultrasonic diagnosis of solid focal liver lesions

肝血管瘤、原发性肝癌、肝转移瘤、肝囊肿、肝脓肿、肝硬化、脂肪肝等常见病的典型超声表现

Typical sonographic features of common diseases including hepatic hemangioma, primary liver cancer, metastatic liver cancer, hepatic abscess, liver cirrhosis and fatty liver, et al

第三节 胆道疾病超声诊断 Ultrasonic diagnosis of biliary tract diseases

一、正常胆囊及肝内外胆管解剖及声像图特点 Anatomic and sonographic characteristics of the normal gallbladder, intrahepatic and extrahepatic bile duct

二、检查方法 Methods of examinations

三、常见胆囊及胆管疾病超声诊断 Ultrasonic diagnosis of common diseases of the gallbladder and the biliary tract

第四节 胰腺疾病超声诊断 Ultrasonic diagnosis of pancreatic diseases

一、正常胰腺解剖及声像图特点 Anatomic and sonographic characteristics of the normal pancreas

二、检查方法（包括注意事项、检查前准备、患者体位、探头频率、扫查方法等）

Methods of examinations (including considerations, examination preparation, patient position, probe frequency and scanning methods, et al)

三、常见胰腺疾病超声诊断。常见胰腺疾病的典型声像图特点 Ultrasonic diagnosis and sonographic characteristics of common pancreatic diseases

第五节 脾脏疾病超声检查 Ultrasonic diagnosis of splenic diseases

一、正常脾脏解剖及声像图特点 Anatomic and sonographic characteristics of the normal spleen

二、检查方法（包括注意事项、检查前准备、患者体位、探头频率、扫查方法等）

 Methods of examinations (including considerations, examination preparation, patient position, probe frequency and scanning methods, et al)

三、常见脾脏疾病超声诊断 Ultrasonic diagnosis of common splenic diseases

第六节 泌尿系统超声检查方法 Ultrasound examination of urinary system

第七节 超声检查在泌尿系统的应用 Application of ultrasound in urinary system

第八节 肾结石、肾积液、肾囊肿、肾肿瘤、膀胱结石、膀胱肿瘤的典型声像图表现

Typical ultrasound images for nephrolithiasis, hydronephrosis, renal cyst, vesical calculus and tumor

**2、教学基本要求 Basic requirements**

（1）掌握：肝脏解剖及分段，胆囊、胆管、胰腺、脾脏正常解剖，腹部常见疾病的典型超声表现；泌尿系统正常解剖结构

Master the liver anatomy and segmentation, normal anatomy of gallbladder, bile duct, pancreas, spleen, typical ultrasonic manifestations of common abdominal diseases；Master the normal anatomical structure of urinary system

（2）熟悉：正常肝脏、胆囊、胆管、胰腺、脾脏超声表现；熟悉：正常肾、输尿管、膀胱超声表现，肾结石、肾积水、肾囊肿、肾肿瘤、膀胱结石、膀胱肿瘤超声表现

 Familiar with the normal ultrasonic manifestations of liver, gallbladder, bile duct, pancreas and spleen；Familiar with the ultrasonic manifestations of normal kidney, ureter, bladder, kidney stone, hydronephrosis, kidney cyst, kidney tumor, bladder stone, bladder tumor

（3）了解：脾脏增大、脾囊肿、副脾、脾外伤等疾病的典型超声表现；肾脏先天性畸形超声诊断

Understand the typical ultrasonic manifestations of splenic enlargement, splenic cyst, accessory spleen, splenic trauma and other diseases；Understanding the ultrasonic diagnosis of kidney congenital malformation

**3、重点与难点**

（1）重点：原发性肝癌、肝转移癌、胆道结石、胆囊癌、胆管癌、胰腺癌、急慢性胰腺炎的超声诊断；常见肾脏囊性病变的超声表现。

Diagnosis of primary hepatic carcinoma, metastatic hepatic carcinoma, cholelithiasis, carcinoma of gall bladder, cholangiocarcinoma, pancreatic carcinoma, pancreatitis.；Diagnosis of cystic renal diseases.

（2）难点：原发性肝癌与肝转移癌超声鉴别诊断，胆囊癌的分型及超声诊断。

Differential ultrasonic diagnosis between primary and metastatic hepatic carcinoma, types and ultrasonic diagnosis of carcinoma of gall bladder.

 **4、育人元素**

超声技术的发展大大提高了图像分辨率，为腹部疾病诊断提供重要参考信息

The development of ultrasound technology has greatly improved the image resolution and provided important reference information for the diagnosis of abdominal diseases.

**5、周次**

第17周

### 第三章 浅表器官和血管疾病的超声诊断 Ultrasonography for Superficial Organs and Vascular Diseases

**1、教学内容 Teaching contents**

第一节 甲状腺、乳腺、体表、生殖器、血管的正常解剖声像特点 Normal ultrasound images for thyroid, breast, surface, genitals and blood vessels

第二节 检查方法 Methods of ultrasound examination

1. 常见浅表及血管疾病的超声诊断 Ultrasound diagnosis for common diseases of superficial organs and blood vessels

 乳腺囊性增生、纤维腺瘤、乳腺癌、甲亢、结节性甲状腺肿、甲状腺癌、甲状旁腺肿瘤、睾丸扭转、睾丸肿瘤、精索静脉曲张、体表肿物、神经肿瘤、神经鞘瘤、下肢深静脉血栓、动脉血栓形成、下肢静脉曲张、颈血管疾病、动脉瘤。

cystic hyperplasia, breast fibroadenoma, breast carcinoma, hyperthyroidism, nodular goiter, thyroid and parathyroid carcinoma, testicular torsion, testicular tumors, varicocele, body mass, neural tumor, schwannoma, deep venous thrombosis, arterial thrombosis, lower limb varicosity, trans-vascular diseases, aneurysm

**2、教学基本要求 Basic requirements**

（1）掌握：甲状腺、乳腺、血管的正常解剖

Master the normal anatomy of the thyroid gland, breast, and blood vessels.

（2）熟悉：正常甲状腺、乳腺、血管的超声表现；常见浅表及血管疾病的超声表现

 Familiar with the normal ultrasound appearance of the thyroid gland, breast, and blood vessels; the ultrasound appearance of common superficial and vascular diseases.

（3）了解：体表及生殖器疾病的超声表现

 Understand the ultrasound appearance of diseases of the body surface and genitals.

**3、重点与难点**

常见甲状腺、乳腺、血管疾病的超声表现

The ultrasound appearance of common thyroid, breast, and vascular diseases.

**4、育人元素**

甲状腺、乳腺、血管疾病是临床常见病，超声检查在浅表及血管疾病的筛查和疾病评估中发挥重要作用。

Thyroid, breast, and vascular diseases are common in clinical practice. Ultrasound examination plays an important role in the screening and disease assessment of superficial and vascular diseases.

**5、周次**

第17周

### 第四章 妇产科疾病超声诊断 Diagnostic Ultrasound in Obstetrics and Gynecology

**1、教学内容 Teaching contents**

第一节 妇科疾病超声诊断 Gynecologic Sonography

一、妇科超声诊断的临床应用基础 Principles of Scanning Technique in Obstetric and Gynecologic Ultrasound

二、正常女性生殖器官超声表现 Normal Sonographic Anatomy of the Female Pelvis

三、子宫疾病的超声诊断 Disease of the Corpus Uteri

四、子宫腔及子宫内膜病变的超声诊断 Disease of the Uterine Cavity and the Endometrium

五、卵巢疾病的超声诊断 Disease of the Ovary

第二节 产科疾病超声诊断 Obstetric Sonography

一、妊娠生理 Normal Pregnancy

二、早期妊娠的超声诊断 Sonographic Evaluation of First Trimester

三、中晚期妊娠的超声诊断 Sonographic Evaluation of Second and Third Trimester

四、异常妊娠的超声诊断 Pathological Pregnancy

五、胎儿异常的超声诊断 Ultrasound of Congenital Fetal Anomalies

**2、教学基本要求 Basic requirements**

（1）掌握：无脑儿、无叶型前脑无裂畸形、严重脑膨出、严重开放性脊柱裂、严重胸腹壁缺损伴内脏外翻、单腔心、单一大动脉、双肾缺如、致死性软骨发育不良的产前超声诊断

Master the prenatal ultrasound diagnosis of anencephaly, lobar forebrain acyloschisis, severe encephalocele, severe open spina bifida, severe thoracoabdominal wall defect with visceral ectropion, single heart, single aorta, double kidney absence, and fatal chondrodysplasia

（2）熟悉：常见妇产科的超声声像图及其超声描述

 Familiar with the common ultrasound images of obstetrics and gynecology and their ultrasonic descriptions

（3）了解：少见妇产科疾病的超声诊断分析原则

Understanding the principles of ultrasonic diagnosis and analysis of rare gynecological and gynecological diseases

**3、重点与难点**

（1）重点：各期流产的超声表现，各型异位妊娠的超声表现，前置胎盘超声分类分型，胎盘早期剥离超声表现，葡萄胎临床与超声表现，恶性滋养细胞疾病临床与超声表现，子宫体与子宫基层病变的超声诊断，子宫腔与子宫内膜病变的超声诊断，卵巢病变的超声诊断。

diagnostic sonography of disease of the corpus uteri, endometrial and intrauterine diseases, ovarian diseases, hydatidiform mole, malignant trophoblastic disease, sonographic assessment of ectopic pregnancy, placenta previa and placental abruption, the prenatal ultrasonic diagnosis of common congenital fetal anomalies.

（2）难点：各期流产的超声表现与临床分型的相关性，异位妊娠的临床转归，鉴别诊断，滋养细胞疾病的临床特征与超声表现的相关性，子宫体与子宫肌层病变的超声鉴别诊断，子宫腔与子宫内膜病变的超声鉴别诊断，卵巢病变的超声鉴别诊断。

The differential diagnosis of the corpus ulteri, endometrial and intrauterine diseases, ovarian diseases, the differential diagnosis and outcomes of ectopic pregnancy.

 **4、育人元素**

妇科系统疾病是临床常见病，超声检查在妇科疾病的筛查和疾病评估中发挥重要作用。

Gynecological diseases are common diseases. Ultrasound examination plays an important role in the screening and evaluation of gynecological diseases.

**5、周次**

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### 第五章 心血管疾病的超声诊断 Ultrasonic Diagnosis of Cardiovascular Disease

**1、教学内容 Teaching contents**

第一节 超声心动图检查的基本方法及正常图像特征 Basic Method of Echocardiography Examination and Normal Image Features

一、M型超声心动图 M-mode Echocardiography

二、二维超声心动图 Two-dimensional Echocardiography

三、频谱多普勒超声心动图 Spectral Doppler Echocardiography

四、彩色多普勒血流显像 Color Doppler Flow Image

第二节 风湿性心脏病的超声诊断 Ultrasonic Diagnosis of Rheumatic Heart Disease

一、二尖瓣狭窄的超声诊断 Ultrasonic Diagnosis of Mitral Stenosis

二、二尖瓣关闭不全的超声诊断 Ultrasonic Diagnosis of Mitral Insufficiency

第三节 先天性心脏病的超声诊断 Ultrasonic Diagnosis of Congenital Heart Disease

一、房间隔缺损的超声诊断 Ultrasonic Diagnosis of Atrial Septal Defect

二、室间隔缺损的超声诊断 Ultrasonic Diagnosis of Ventricular Septal Defect

三、动脉导管未闭的超声诊断 Ultrasonic Diagnosis of Patent Ductus Arteriosus

四、法洛四联症的超声诊断 Ultrasonic Diagnosis of Tetralogy of Fallot

第四节 心肌病的超声诊断 Ultrasonic Diagnosis of Cardiomyopathy

一、扩张型心肌病的超声诊断 Ultrasonic Diagnosis of Dilated Cardiomyopathy

二、肥厚型心肌病的超声诊断 Ultrasonic Diagnosis of Hypertrophic Cardiomyopathy

第五节 冠心病的超声诊断 Ultrasonic Diagnosis of Coronary Artery Disease

一、冠心病的超声诊断特征 Ultrasonic Diagnostic Features of Coronary Artery Disease

二、心肌梗死的超声诊断及并发症的超声表现 Ultrasonic Diagnosis of Myocardial Infarction and Ultrasonic Features of Complication

第六节 心包疾病的超声诊断 Ultrasonic Diagnosis of Pericardial Disease

一、心包积液定性与定量诊断 Qualitative and Quantitative Diagnosis of Hydropericardium

了解心包填塞的超声诊断特征

 Understand the ultrasonic diagnostic features of pericardial tamponade

二、缩窄性心包炎的超声诊断 Ultrasonic Diagnosis of Constrictive Pericarditis

第七节 心功能的超声评价 Ultrasonic Evaluation of Cardiac Function

一、左室收缩功能的超声评价 Ultrasonic Evaluation of Left Ventricular Systolic Function

二、左室舒张功能的超声评价 Ultrasonic Evaluation of Left Ventricular Diastolic Function

**2、教学基本要求 Basic requirements**

（1）掌握：超声心动图检查的基本方法，M型二尖瓣前叶活动曲线特点，二尖瓣狭窄及关闭不全的超声征象，房间隔缺损及室间隔缺损及法洛四联症超声征象

Master the basic methods of echocardiography, characteristics of M-type anterior mitral valve activity curve, ultrasonic signs of mitral stenosis and insufficiency, atrial septal defect, ventricular septal defect and tetralogy of Fallot

（2）熟悉：冠心病的超声诊断特征。

 Familiar with the ultrasonic diagnostic characteristics of coronary heart disease.

（3）了解：扩张型心肌病的超声特征

 Understand the ultrasonic characteristics of dilated cardiomyopathy

**3、重点与难点**

（1）重点：M型超声心动图二尖瓣活动曲线特征及意义，风湿性心脏病二尖瓣狭窄及关闭不全的超声征象，先天性心脏病房间隔缺损与法洛四联症的超声征象。

activity curve characteristic of anterior mitral valve on M-mode, ultrasonic features of mitral stenosis and insufficiency, ultrasonic features of atrial septal defect, ventricular septal defect and tetralogy of fallot

（2）难点：理解二维超声行动图常用切面，理解频谱多普勒超声的临床应用。

understand the common section of two-dimension ultrasonography, clinical application of spectral Doppler ultrasonography.

 **4、育人元素**

心血管系统疾病是临床常见病，严重威胁人民健康，超声检查在心血管系统疾病的筛查和疾病评估中发挥重要作用。

Cardiovascular system disease is a common clinical disease, which seriously threatens people's health. Ultrasound examination plays an important role in screening and disease evaluation of cardiovascular system disease.

**5、周次**

第18周

### 第六章 介入超声学 Interventional ultrasound

介入超声包括在实时超声的监视和引导下完成的各种穿刺活检、造影、抽液、插管、注药，将探头置入体内的术中超声和内镜超声等的一系列技术，具有微创、简便、经济、有效的优点，为现代医学诊疗提供了新的给药途径和手术方法，是现代临床医生必须具备的知识之一。

Interventional ultrasound includes diagnostic or therapeutic minimally invasive procedures that monitored and guided by real-time ultrasound imaging, such as ultrasound-guided fine- and coarse-needle biopsy, drainage, catheterization and drug injection, contrast-enhanced ultrasonography, intraoperative ultrasonography, in which the probe is put into the body, and endoscopic ultrasonography. It is minimally invasive, simple, convenient, economical and effective, and provides new administration routes and surgical methods for diagnosis and therapy in modern medicine, therefore being one of the requisite knowledge areas of modern clinicians.

 **1、教学内容 Content of courses**

**第一节、总论 Overview**

（一）介入超声的定义 Definition of interventional ultrasound

（二）介入超声应用范围、适应症、禁忌症 Applications, indications, contraindications of interventional ultrasound

（三）介入超声的原理、仪器设备、基本技术、基本原则、操作技巧、并发症与注意事项Fundamentals, instruments, basic techniques, basic principles, operative skills, complications and notes of interventional ultrasound

（四）常见疾病的介入超声治疗的临床应用Clinical applications of interventional ultrasound in common diseases

适应症、禁忌症，术前术后处理、操作过程、注意事项、临床意义

Indications, contraindications, preoperative and postoperative managements, operational processes, notes and clinical significance

**第二节、常用介入治疗术 Common ultrasound-guided interventions**

（1）超声引导经皮穿刺肝囊肿硬化治疗术 Ultrasound-guided percutaneous needlepunctureaspiration and sclerotherapyof hepatic cysts

（2）超声引导经皮穿刺肾囊肿硬化治疗术 Ultrasound-guided percutaneous needle puncture aspiration and sclerotherapy of renal cysts

（3）超声引导经皮穿刺肝肿瘤等组织活检术 Ultrasound-guided percutaneous needle puncturebiopsies of hepatoma and other tissues

（4）超声引导经皮穿刺脓肿置管引流术 Ultrasound-guided percutaneous needle puncturedrainage and catheterization of abscess

（5）超声引导经皮穿刺肝癌消融治疗术 Ultrasound-guided percutaneous needle punctureablation therapy of liver cancer

（6）超声引导经皮穿刺胆管引流术 Ultrasound-guided percutaneous transhepaticcholangiodrainage (PTCD)

（7）超声引导经皮穿刺胸水穿刺引流术 Ultrasound-guided percutaneous needle puncture drainage and catheterization of pleural effusion

**第三节、超声内镜基础知识 Basic knowledge of endoscopic ultrasonography**

（1）超声内镜在胆胰疾病诊断的作用 Role of endoscopic ultrasonography in the diagnosis of biliopancreatic diseases

（2）常见疾病的典型超声内镜表现 Typicalendoscopicultrasonographymanifestations of common diseases

（3）超声内镜和管道内超声的现状与发展 Current situation and prospect of endoscopic ultrasonography and intraductalultrasonography

**第四节、术中超声基础知识 Basic knowledge ofintraoperative ultrasonography**

（1）术中超声在临床诊疗的作用 Clinical significance of intraoperative ultrasonography

（2）术中超声的仪器要求 Instrument requirements of intraoperative ultrasonography

（3）术中超声的检查过程和注意事项Operational processes and notes of intraoperative ultrasonography

**2、教学基本要求 Course Objective and Requirements**

（1）掌握： 超声内镜基础知识

 Master the basic knowledge of endoscopic ultrasonography

（2）熟悉：常用介入治疗术

Familiar with theCommon ultrasound-guided interventions

（3）了解：术中超声基础知识

Understand the basic knowledge of intraoperative ultrasonography

**3、重点和难点 Highlight and difficulties**

介入超声应用范围、适应症、禁忌症Applications, indications, contraindications of interventional ultrasound

**4、育人元素**

介入超声的发展，大大拓展的疾病精准微创治疗的适应证。

The development of interventional ultrasound has greatly expanded the indications of precise minimally invasive treatment of diseases.

**5、周次**

第17周

## （三）教学环节安排

**（对各种教学环节的安排如：实验、实习、习题课、作业等以及本课程与其他相关课程的联系、分工等作必要说明，教学环节的安排体现高阶性、创新性、挑战度）**

1. 理论课（约占课时80%）：由教师讲课，以理论讲授为主，结合临床实践、阅片进行授课。

2. 实习课（约占课时20%）：以学生自主阅片为主，教师及助教进行答疑。

3. 习题：阅片练习

## （四）教学方法

**（包括课堂讲授、提问研讨，课后习题和答疑等情况，要增加团队学习、小组大作业、实验课和理论课的结合、使用信息技术方法、由教师和知识为中心转化为以学生和学习为中心）**

1. 应用多媒体课件等行理论授课。

2. 通过阅读大量临床教学图片，掌握常见病、多发病的影像学表现、诊断和鉴别诊断。

3. 实习：利用多媒体在课堂进行病例读片、讨论实习；通过网络教学平台学习，巩固课堂教学的知识。

## （五）课程教材

**（主讲教材尽量使用“马工程”和国家规划教材，在同类教材中，优先选用国家级规划教材，凡教材选用范围中有“马工程”重点教材的，必须选用工程重点教材。）**

孟悛非，冯仕庭主编，《医学影像学》第四版，全国高等学校医学规划教材，“十四五”普通高等教育本科国家级规划教材，高等教育出版社，2022年

## （六）主要参考书目

**（推荐若干参考书，并注明书名、作者、出版社、版本、出版日期等，每个章节指定一定数量、明确的阅读资料）**

1. 郭启勇. 实用放射学.第四版.北京：人民卫生出版社，2015

2. 唐光健、秦乃姗.现代全身CT诊断.第三版，北京：中国医药科学出版社，2013

3. 周康荣，陈祖望.体部磁共振成像.上海：上海医科大学出版社，2012

4. 田家玮、张运、姜玉新 超声医学，北京 人民卫生出版社

5. 教学网站 http//jpkc.sysu.edu.cn/2006/fszdx/index.htm

## （七）成绩评定方式

**（原则上平时成绩（包括期中考试、课堂讨论、测验、作业、论文、出勤情况等）占总成绩的40%，期末成绩占总成绩的60%）**

本课程考核分两部分：期中考试占50%，期末考试占50%，平均分大于60分为及格。

每部分考试分为理论考试及阅片考试，理论考试占总成绩的70%，阅片考试占30%。

**注：*教学大纲一律使用A4纸，正文为小四号宋体。***