HAROLD THOMAS HYMAN, M.D.

# DIFFERENTIAL DIAGNOSIS

## AN INTEGRATED HANDBOOK

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## An Integrated Handbook

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# PREFACE

To secure maximal benefits from the vast treasury of therapeutic capital now available to the physician, early and accurate diagnosis is the first and most important step. In the preparation of my multivolume "Integrated Practice of Medicine" (1946) and the single-volume "Handbook of Differential Diagnosis" (1953 and 1957) I sought to emphasize the obvious fact that the key person in the accomplishment of early and accurate differential diagnosis is the man-on-the-spot.

The present volume has evolved from its predecessors. It is a further extension of my efforts to provide the doctor-on-the-spot (whether undergraduate, interne, resident, family practitioner, internist, surgeon or specialist) with a convenient and concise guide to the intricacies and subtleties of the art and science of differential diagnosis. In particular, I direct attention to these special features, some unique in publications devoted to the subject at hand:

- Interpretations of minimal subjective symptoms and seemingly trivial objective signs that often are the storm signals of gathering organic disease.
- Reliance on progressive changes, such as rising blood pressure gradient, falling red count, minimal alterations in serial electrocardiograms or small characterologic changes, that act as straws in the wind for the keen observer.
- Use of therapeutic tests as legitimate adjuvants to diagnostic investigation.
- Recognition of the frequent intrusion of psychogenic overtones and of manifestations due to drug idiosyncrasies, hypersensitivities and poisonings as "herrings" drawn across diagnostic trails.
- Addition of special sections, dealing with changes in body chemistry and metabolism, that often permit the recognition and treatment of functional disturbances before organic changes have occurred and that often respond to simple and safe therapeutic endeavors.
- Overall concern with the living patient, afflicted with a frequently encountered, nonfatal and treatment-responsive condition rather than preoccupation with the victim of some terminal illness, a treatment-resistant entity or a bizarre clinical curiosity.
- Liberal use of cross references, in parentheses, to integrate the text and

reduce the amount of verbiage that often tends to confuse rather than clarify presentations in more voluminous and unwieldy compilations.

● Rather than illustrations of the end stages of organic diseases, a series of summary charts that may have special appeal to the necessarily "running reader." Of particular interest are those dealing with side reactions, idiosyncrasies, hypersensitivities and poisonings that presently constitute an appreciable segment of office and hospital practice whether as primary complaints or as otherwise inexplicable "complications" of pre-existent afflictions or of operative procedures.

● Incorporation of an extensive INDEX of symptoms, signs and disease processes, printed on tinted paper for convenient reference.

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*Solebury, Pennsylvania*

# Abdominal Pain

Of Parietal Origin
Of Extra-abdominal Origin
(Reflex Abdominalgia)
Of Intra-abdominal Origin
(Intraperitoneal)
Epigastric
Umbilical
Right Hypochondriac
Left Hypochondriac
Right Iliac
Left Iliac
Hypogastric
Generalized
In Infancy and Childhood
In Association With Pregnancy
In the Elderly

The practicing physician is frequently challenged by the complaint of abdominal pain. Especially at the onset of a "bellyache," when physical signs are indefinite and laboratory data are unavailable, the *man-on-the-spot* may be compelled to commit his patient and himself to a definite course of action on the basis of evidence that is incomplete, inconclusive and incapable of verification. Under these circumstances, errors of judgment are bound to occur.

To minimize chances for error, either by omission or commission, the present text has been subdivided so as to encourage an orderly consideration of the many possibilities.

## ABDOMINAL PAIN OF PARIETAL ORIGIN

Despite their relative unimportance, disturbances of the abdominal parietes may produce pain that simulates the bellyache caused by more momentous intraperitoneal disorders. (See also Abdominal Wall, Painless Disturbances of, p. 21.)

● **Intercostal Neuralgia.** Note linear band of cutaneous hyperalgesia. Get x-ray pictures of ribs and spine to determine basic cause (rib fracture, spinal caries, dislocations or infections of intervertebral disks, etc.).

● **Herpes Zoster.** Note pre-eruptive band of pain and hyperalgesia and later appearance of characteristic vesicles along course of involved nerve. Observe response to corticosteroids.

● **Infected Sinus Tract.** Complicating regional ileitis, nonspecific ulcerative colitis, costal or vertebral osteomyelitis or peritonitis. Identify source of infection. Demonstrate pathogen in spreads or tissue sections. Request special stains for tubercle bacilli and mycoses.

● **Periumbilical Cellulitis.** As complication of omphalitis, persistent urachus (note urine reflux when bladder is distended), and/or persistent Meckel's diverticulum (note fecal odor and discharge).

● **Relapsing, Febrile, Nonsuppurative Panniculitis** (Weber-Christian Syndrome). Note multiple, tender, erythematous nodules of wall, thighs and legs. Presumably an allergic hypersensitivity, usually to drugs or bacteria. Observe response to corticosteroids while seeking offending allergen (p. 29).

● **Adiposis Dolorosa** (Dercum's Disease). Note multiple, painful nodules of cutaneous and subcutaneous tissues in the pathologically obese. Get x-ray picture of skull (deformities of sella turcica; signs of increased intracranial pressure). Consult neurosurgeon.

● **Hernias.** May be linear (rectus abdominalis), umbilical, inguinal, femoral, or incisional. Examine erect and

recumbent before and during cough to demonstrate defect and sac. Latter may contain pinched-off omentum or loop of hollow bowel. Unless readily controlled by strapping (umbilical) or truss, recommend surgery.

● **Muscle Strain or Rupture.** Usually of rectus abdominalis. From violent exertion or cough. Especially during pertussis or typhoid (Zenker degeneration of muscle).

● **Localized Myositis.** Due to abscess (typhoid) or encysted parasite (trichinosis). In latter, note eosinophilia.

● **Slipping Rib or Costochondral Disarticulations.** Sudden, severe pain from direct blow, awkward position, violent cough, emesis, etc. Especially during pregnancy. ***On right,*** may simulate biliary colic; ***on left,*** penetrating ulcer or cardiac angina. Locate "trigger point." Reproduce pain by finger-tip pressure. Relieve by ethyl chloride spray or injection of local anesthetic.

● **Rib Fracture.** From direct or indirect injury. May be pathologic, especially in the elderly and others with disturbances of bone metabolism (p. 68). Attempt relief with injection of local anesthetic.

● **Subluxation of Symphysis Pubis.** Following childbirth with localized pain and tenderness.

● **Osteitis Pubis.** In the elderly, with localized pain and tenderness.

## ABDOMINAL PAIN OF EXTRA-ABDOMINAL ORIGIN (REFLEX ABDOMINALGIA, ABDOMINAL NEURALGIA)

Few physicians escape the embarrassment of occasionally advising or performing exploratory laparotomy when the pain-producing cause is a generalized disturbance, a supradiaphragmatic or retroperitoneal lesion, or a functional or organic neuropsychiatric disorder (reflex abdominalgia; abdominal neuralgia).

● **Pharmacodynamic.** ***Due to overdoses of, or hypersensitivity to,*** laxatives, salines, purgatives, drastics, abortefacients, anthelmintics, hematinics, uricolytics, cholinergins, cholinesterase inhibitors, oxytocics, etc. (p. 138). CAUTION. History may be denied when drugs have been self-prescribed for weight reduction or to produce abortion.

● **Toxicologic.** ***Due to occupational or domestic exposure to*** insecticides (Parathion, etc.); metals (As, Cd, Fl, I, Pb, Hg, Ni, P, Th, Zn); or to miscellaneous chemicals (carbon tetrachloride, tetrachloroethylene, turpentine, benzols, benzenes, etc.). ***After ingestion of poisonous foods or drinks*** (fava bean, mushrooms, methyl alcohol, etc.). ***Following spider or snake bite*** (with marked abdominal rigidity, suggestive of "surgical" belly). *See* Poisonings (p. 292).

● **Metabolic.** Due to ***acidosis*** (sweet breath odor, acetonuria), ***milk-alkali syndrome*** (history of protracted adherence to rigid "ulcer cure"), ***spontaneous hypoglycemia*** (pancreatic insular adenomatosis), ***induced hypoglycemia*** (overdoses of antidiabetic preparations, failure to "cover" correct dose), ***uncontrolled diabetes*** (glycosuria, acetonuria, hyperglycemia), ***porphyrias*** (dark urine, bullous skin lesions), ***addisonian crises*** (mucosal pigmentation, hypotension), ***uremia*** (uriniferous breath odor, anuria, azotemia).

● **Allergic.** Suspect allergic origin in the presence of ***associated rashes*** (purpura, erythema multiforme, lupus erythematosus), ***peripheral vascular le-***

***sions*** (periarteritis nodosa), ***arthralgias and cardiac murmurs*** (rheumatic fever), ***hemolytic crises*** (familial hemolytic jaundice with splenomegaly, sickling and target cells), or ***ascites*** (periodic abdominalgia). Observe response to cautiously administered test dose of corticosteroid but avoid continued administration (may cause peptic ulceration or painless perforation).

● **Cardiorespiratory.** Due to ***basal pleuritis*** (friction rub), ***lower lobe consolidation*** (lobar pneumonia with early signs of dull tympany; high pitched, suppressed breath sounds; subcrepitant rales), ***angina pectoris*** (relief from nitroglycerin; minor changes, at most, in ECG), ***coronary thrombosis*** (faintness and manifestations of shock, intensified by nitroglycerin; increasing tachycardia; specific changes in ECG, especially serial traces).

● **Renal.** Due to ***pyelitis and pyelonephritis,*** especially in young females (bacilluria and pyuria); ***nephrolithiasis*** (crystalluria; radiopaque calculi), ***Dietl's crisis*** (acute hydronephrosis; palpable mass in upper quadrant), ***renal or perirenal suppuration*** (costovertebral tenderness, clear urine, chills, high fever).

● **Neuropsychiatric.** ***Due to irritations or lesions of dorsal roots or peripheral nerves*** (note motor and/or sensory changes, p. 257); ***disturbances of intervertebral disks or vertebral bodies*** (p. 366); ***hypersthenic gastrointestinal neuroses*** (spasmosis of pylorus or sigmoid; hyperacidity, etc., p. 181); ***epileptic or migraine equivalent*** (p. 117); ***reflex abdominaliga*** (increased intracranial tension; cerebrovascular accident, p. 92; brain tumor, p. 74; etc.); ***tabetic crisis*** (absent deep reflexes; Argyll-Robertson pupils; positive CSF, p. 90); ***hysteria*** (diagnose only by exclusion, p. 262); ***drug addiction*** (feigned to get "fix," p. 23); ***drug withdrawal*** ("cold turkey"); ***chronic alcoholism*** (sometimes with abdominal rigidity, presumably from intense gastritis).

## ABDOMINAL PAIN OF INTRA-ABDOMINAL ORIGIN

After elimination of parietal and extra-abdominal causes for abdominal pain, the investigation narrows to a consideration of intra-abdominal disturbances. Differing possibilities are suggested by the location of the pain, whether localized to a particular zone or generalized.

Under ideal conditions, the diagnostician has the time and the facilities for conducting an extensive survey. Under less than ideal conditions, when time is of the essence, the man-on-the-spot is compelled to jettison academic refinements in diagnosis and decide whether the suspected intra-abdominal disturbance is, or is not, surgical. Fortunately for the modern physician, the decision to "go in" is no longer fraught with risks that accompanied surgery of earlier eras. Indeed, present conduct of an **exploratory laparotomy** has been made so free from complications, morbidity and mortality that it is often safer to "take a look" than to pursue what was formerly termed a "conservative course."

### Epigastric Pain

In considering causes for epigastric pain, attention focuses on disturbances of underlying structures such as terminal esophagus, stomach, duodenal cap, transverse colon, pancreas and biliary tract. In addition, the experienced diagnostician remembers that acute inflammation of the vermiform appendix is

ushered in occasionally by pain referred to the pit of the stomach.

● **Spasm, Ulcer or Cancer of Esophagus.** Usually with precedent or accompanying dysphagia (p. 141). Demonstrate during ingestion of thick barium mixture. Visualize by esophagoscopy. Get tissue specimen for histologic examination.

● **Diaphragmatic Hernias.** May be congenital or acquired; esophageal or para-esophageal. Sometimes with eventration of diaphragm and thoracic intrusion of stomach ("upside-down stomach"). May be responsible for otherwise inexplicable hematemesis, melena and secondary anemia.

● **Gastritis.** Most frequent cause. From irritation of stomach mucosa due to gluttony; failure to masticate; rapid overdistention; roughage foods; "hot" sauces and condiments; failure to dilute gastric contents with needed fluids (soup, table wine, caffeinated or decaffeinated after-dinner beverages); failure to "burp" gas bubble, trapped in fundus; drinking iced fluids, especially carbonated beverages, when overheated; and accidental or suicidal swallowing of strong acids, corrosives or other poisons. In emergency, induce vomiting or consider gastric lavage.

● **Hypersthenic Gastric Neuroses.** Second most frequent cause (p. 181). With hyperacidity, hypermyxorrhea, hypermotility, or spasmosis (cardiospasm, pylorospasm). Often psychogenic. Note response to antispasmodics, sedatives or tranquilizers.

● **Cascade Stomach.** With episodes of intermittent obstruction between upper and lower pouches. Due to impaction of chunks of meat or sticky candy in connecting channel.

● **Infantile Hypertrophic Pyloric Stenosis.** With persistent vomiting, often projectile; weight loss; visible epigastric peristalsis; and palpable tumor. Unless rapidly responsive to conservative treatment with thick cereals and antispasmodics, prepare for surgery.

● **Peptic Ulcer.** History of hunger pains, relieved by food and antacids. With demonstrable defect of duodenum, try conservative treatment. With demonstrable or suggestive gastric defect, favor surgical intervention to prove or disprove malignancy. During conservative treatment, instruct patient to report immediately if pain changes in character or intensifies (possible perforation or penetration). Warn against medication with corticosteroids (may cause painless penetration or perforation).

● **Cicatricial Pyloric Stenosis.** Complicating peptic ulceration. Note increasing discomfort, failure to obtain relief from antacids, delayed emptying time, and increased gastric residue. Requires surgical relief.

● **Chronic Gastrectasis.** Usually due to organic pyloric obstruction. Drain to restore relative normality prior to surgery.

● **Prolapse of Gastric Mucosa Through Pylorus.** Symptoms suggest peptic ulceration and/or cicatricial stenosis. Demonstrate by x-ray pictures. Relieve surgically.

● **Duodenal Ileus.** Note gastric distress intensified by bending over (to tie shoelaces). Demonstrate obstruction at ligament of Treves with dilatation of proximal duodenal loop. May require surgical correction.

● **Acute Gastric Dilatation.** Sometimes due to over-rapid filling but often toxic (postanesthetic, postoperative, with overwhelming infection, etc.). Note epigastric fullness and tympany. If necessary, pass intranasal tube to

evacuate and drain stomach. While intragastric tube is in place, start intravenous infusion to prevent or correct electrolytic imbalances.

● **Gastric Cancer.** With unrelieved and irregular dyspepsia. Note anacidity, occult blood in stools, secondary anemia, and filling defect. Prepare for immediate surgery.

● **Cancer of Colon.** Usually a constricting neoplasm of transverse loop with intermittent episodes of partial intestinal obstruction. Feel mass. Avoid barium meal but demonstrate by barium enema.

● **Acute Hemorrhagic Pancreatitis.** With excruciating pain and signs of shock. Look for discoloration of abdominal wall (Cullen's sign), thighs and flanks (Grey-Turner sign). After 8 to 24 hours, observe rise in urinary and serum amylase. At operation, note areas of fat necrosis in wall and omentum.

● **Chronic Pancreatitis.** Usually with stone formation. Distress vague but intractable. Except for possible distortion of duodenal loop, x-ray findings equivocal. Consider exploration.

● **Acute Appendicitis.** Early discomfort in pit of stomach with later shift to right lower quadrant. Suspect with slight fever and leukocytosis, direct tenderness, and some rigidity. Prepare for immediate surgical intervention.

● **Gallbladder Colic.** Usually referred to right upper quadrant with radiation to shoulder but may be noted first in epigastrium. Elicit tenderness at Murphy's point. With accompanying hydrops of bladder, feel mass descending with inspiration. Examine serum and urine for bile pigments (p. 62). Get x-ray pictures before and after dye to demonstrate radiopaque and radiotranslucent calculi. Favor immediate surgical intervention.

### Umbilical Pain

In infancy and childhood, pain is not infrequently referred to the umbilicus and the periumbilical region, later described in detail (v.i.). In the adult, suspicion centers on the appendix; in the elderly, on the possibility of mesenteric thrombosis (v.i.).

● **Acute Appendicitis.** With localized pain and tenderness, usually shifting to right lower quadrant when appendix is in normal position. Note muscle rigidity, rising temperature, and leukocytosis. Advise immediate laparotomy.

● **Mesenteric Thrombosis.** Complicating arteriosclerosis and/or phlebothrombosis. With sudden episode of violent pain, shock, and collapse. Note blood in stools. Consider surgical intervention.

### Right Hypochondriac Pain

Pain in the right upper quadrant presents a perplexing diagnostic problem since the area is tightly packed with a variety of intra-abdominal structures (liver, biliary passages, gastric pylorus, duodenum, hepatic colon, pancreatic ducts, and the vast portal system of veins and tributaries).

● **Congestion of Liver.** With other evidences of circulatory failure. Note tender enlargement of liver. Also pulsation in tricuspid insufficiency (p. 89). Observe regression with restoration of circulatory efficiency.

● **Toxic Hepatitis.** Following exposure to hepatotoxic drugs, chemicals, etc. (*See* Hypersensitivities, etc., p. 200, and Poisoning, p. 292). Note tenderness and enlargement of liver and jaundice (p. 217). With later shrinkage of liver, suspect acute yellow atrophy (p. 231).

● **Biliary Cirrhosis** (Hanot). Note tender hepatomegaly with fever and splenomegaly (p. 104). Usually post-infectious in youthful patients.

● **Infectious Hepatitis.** Tender hepatomegaly whether infection is viral ("catarrhal jaundice") or spirochetal (Weil's icterohemorrhagic fever). In latter, look for leptospira in urine (p. 354).

● **Liver Abscess.** Tender hepatomegaly complicating amebiasis (*E. histolytica* in stools), helminthiasis (ova or parasites in stool), or portal thrombophlebitis (pylephlebitis). Note responses to specific drugs before surgical exploration.

● **Subphrenic Abscess.** With fever, leukocytosis and jar tenderness posteriorly. If unresponsive to antibiotics, request exploratory puncture with immediate surgical drainage if pus is obtained. Leave needle in place as guide to drainage.

● **Biliary Colic.** With hydrops of gallbladder, advise immediate exploration. Without demonstrable hydrops, get gallbladder series to demonstrate radiopaque and radiotranslucent calculi.

● **Peptic Ulcer.** With hunger pain, relieved by food and alkali. Note free acid; and characteristic gastric or duodenal defect, demonstrable during barium meal. With more persistent distress, suspect penetration. Warn patients to avoid treatment with corticosteroids that may be ulcerogenic and that may cause a pre-existent ulcer to penetrate or perforate painlessly.

● **Gastric Malignancy.** Involving prepyloric areas. Note anacidity, occult blood in gastric contents and/or stool, and filling defect after barium meal. Urge immediate surgical exploration.

● **Spasm of Colon or Gaseous Distention of Hepatic Flexure.** Acute "stitch" in side, relieved by antispasmodic and/or local applications of heat.

● **Cancer of Hepatic Flexure.** With persistent, vague distress. Feel tumor. Note occult blood in stools. Demonstrate with barium enema. Urge immediate exploration.

● **Acute Appendicitis.** Especially when appendix has failed to descend and/or is retrocecal with tip pointed upward. Note direct and rebound tenderness, fever and rigidity. Requires immediate surgery.

● **Acute Hemorrhagic Pancreatitis** (*See* Epigastric Pain).

● **Cysts, Adenomas, Chronic Inflammations and Malignancies of Head of Pancreas.** Only vague discomfort but localization suggested by voluminous, odoriferous stools; steatorrhea, creatorrhea (undigested fats and muscle fibers in feces), and episodes of hypoglycemic shock (hyperinsulinemia with pancreatic adenomatosis). Recommend exploration.

### Left Hypochondriac Pain

Because of the proximity of lower ribs, costal cartilages, heart and base of left lung, pain in the left upper quadrant is often of parietal or extra-abdominal origin. These possibilities merit investigation before considering intraperitoneal causes.

● **Gaseous Distention of Stomach or Splenic Flexure.** With acute "stitch." Note relief from belch or passage of flatus.

● **Gastric Cancer.** Involving fundus or body. Note gastric anacidity, bleeding and filling defect. Urge immediate surgery.

● **Cascade Stomach.** With episodes of obstruction due to impaction of gastric content between upper and lower

pouches. Get x-ray pictures with thin barium mixture. Consider exploration.

● **Colonic Cancer.** In region of splenic flexure. Feel for mass. Note occult blood in stools. Demonstrate by barium enema. Insist on immediate exploration.

● **Cyst or Neoplasm of Tail of Pancreas.** Vague distress. All examinations and findings inconclusive. Suggest exploration.

● **Splenic Infarction, Enlargement or Rupture: Perisplenitis.** Get complete hemogram including tests for fragility and sickling (hemolytic crises), spreads for demonstration of *Pl. malariae,* bone marrow counts, blood cultures, and stools (ova, parasites). Avoid surgery if splenic involvement is merely one manifestation of a systemic disease, but, if laceration or rupture is suspected, especially following trauma, urge immediate exploration. (*See* Anemia, p. 35; Spleen, p. 334.)

### Right Iliac Pain

Pain in the right lower quadrant suggests an attack of acute appendicitis unless that bothersome structure has been removed or all the evidence points away from a typical or an atypical attack.

● **Acute Appendicitis or Appendiceal Abscess.** Initial distress often epigastric or periumbilical, with later shift to right lower quadrant. Note localized pain, direct and rebound abdominal and rectal tenderness, muscle rigidity, slight to moderate fever, and leukocytosis. Prepare for immediate exploration.

● **Meckel's Diverticulum.** With cherry-red periumbilical cellulitis and fecal odor to umbilical discharge. After infection is controlled, proceed with reparative surgery and prophylactic appendectomy.

● **Ileocolonic Retention of Feces or Trapping of Gas in Cecum.** Note absence of fever or leukocytosis. Observe relief following enema.

● **Specific and Nonspecific Enteritis, Ileitis, Ileocolitis, Typhlitis and Colitis.** With diarrhea (p. 134). Note generalized pain and tenderness. Examine stools for amebae, ova, parasites, blood, acid-fast bacilli, and predominant bacterial pathogen. Try to control acute symptoms with diet, antibiotics, tuberculocides or amebacides. Avoid surgery unless penetration or perforation is suspected.

● **Cancer of Cecum or Ascending Colon.** With palpable mass and blood in stool. Demonstrate roentgenographically with barium enema and meal. Prepare for surgery.

● **Mesenteric Lymphadenopathy** (Tabes mesenterica). Often associated with recent upper respiratory infection. Otherwise probably tuberculosis. Indistinguishable from acute appendicitis unless appendectomy has been performed previously. Advise exploration.

● **Inflammation of Appendices Epiploicae.** May simulate attack of acute appendicitis. Advise exploration.

● **Localized Peritonitis or Walled-off Peritoneal Abscesses.** Following pelvic inflammatory disease or acute appendicitis. Note rapid sedimentation rate, leukocytosis, and low-grade fever. Examine bimanually. Consult surgeon and/or gynecologist for operative indications after intensive therapy with broad-spectrum anti-infectives.

● **Inflammation or Neoplasm of Retained Testes.** Note absence from scrotum. Advise immediate exploration.

● **Dysmenorrhea.** At time of normal menstrual period (p. 139).

● **Dysovulation** (Mittelschmerz). Midway in menstrual cycle. May sim-

ulate acute appendicitis so closely that exploratory laparotomy is indicated.

● **Abortion.** After missed period with positive pregnancy tests. Note vaginal discharge and bleeding (p. 298).

● **Stretching of Uterine Ligaments.** In later months of normal pregnancy (p. 299).

● **Ectopic Pregnancy.** With history of 1 or 2 skipped periods followed by irregular bleeding. Demonstrate lateral mass by gentle palpation. Prepare for immediate surgery (p. 299).

● **Onset of Normal Labor.**

● **"After Pains."** With retention of membranes.

● **Postabortal Endometritis or Endocervicitis.** Especially after illegal curettage. Note response to antibiotics (p. 301).

● **Twisted Pedicle of Pedunculated Ovarian Cyst.** Confirm by abdominovaginal palpation. Prepare for surgical intervention.

● **Degeneration of Uterine Fibroid.** Outline nodular uterus with area of localized tenderness. Prepare for surgery.

● **Oöphoritis.** Especially in conjunction with mumps. Note response to corticosteroids.

● **Salpingo-Oöphoritis.** Usually of gonorrheal, postabortal or tuberculous origin. Note mass in fornix and rapid sedimentation rate. Examine urethral and cervical spreads for gonococci. Note specific response of coccal infections to antibiotics. In absence of response, consider laparotomy.

● **Endometriosis.** With long history of dysmenorrhea, menorrhagia and sterility. Look for chocolate cysts of cervix or vaginal walls. Confirm surgically (p. 314).

### Left Iliac Pain

Pain in the left lower quadrant presents fewer diagnostic problems than that in the corresponding right zone. The most important distinction is substitution of lesions of the sigmoid for those of appendix, ileum and cecum.

● **Colonic and Sigmoidal Spasm, Inflammation, Diverticulitis or Malignancy.** Examine directly with sigmoidoscope. Search mucus and pus for blood, amebae, cysts, ova, parasites, and cancer cells. Complete survey with barium enema and barium meal. With suspicion of malignancy, recommend exploration.

● **Intussusception.** Usually in childhood (v.i.). Note acute pain, evidences of obstruction, and rectal passage of red blood. Attempt reduction with gentle enema. Prepare for laparotomy.

● **Volvulus and Other Varieties of Intestinal Obstruction.** Note acute pain, obstipation, and roentgenographic evidences of dilatation of proximal, and collapse of distal, loops (v.i.). Prepare for surgical exploration.

### Hypogastric Pain

The diagnosis of the cause of hypogastric pain is facilitated through digital palpation by way of vagina and/or rectum; through visual exploration by cystoscopy, vaginoscopy, proctoscopy and sigmoidoscopy; through spreads and tissue sections obtained by way of the various scopes; and by retrograde urography following ureteral catheterization after cystoscopy has been completed (p. 358).

● **Congenital Anomalies of the Urachus.** Usually associated with periumbilical cellulitis. Note urine reflux when bladder is distended. Consider surgical correction.

● **Bladder Distention with Urinary Retention or Overflow Incontinence.** Verify by catheterization. Examine specimen for red cells, pus, crystals and bacteria. Get scout film for radiopaque stones. After preparation with anti-infective, request urologist to cystoscope, catheterize ureters, obtain differential renal specimens, and arrange for retrograde and intravenous urography (*see* Uropathies, p. 358).

● **Prostatitis and Seminal Vesiculitis.** Verify by rectal examination and microscopy of urethral discharge, obtained after gentle massage.

● **Gynoid.** As in Right Lower Quadrant (v.s.).

● **Retention or Impaction of Feces.** Verify by rectal examination. Note relief from enema.

● **Gastrovisceroptosis.** Verify pelvic position of stomach by barium meal. Recommend corrective corseting.

● **Enterocolitis.** Usually associated with diarrhea (p. 135). Examine stools microscopically. Get fecal and blood cultures. Obtain serum for agglutination reactions and titers.

● **Atypical Acute Appendicitis.** Note localized direct and rebound abdominal and rectal tenderness, low-grade fever, and leukocytosis. Insist on exploration.

● **Diverticulitis of Sigmoid.** With manifestations closely simulating those of acute appendicitis. Following antibiotic treatment, consider exploration.

● **Intestinal Obstruction.** Particularly volvulus and intussusception. Get film of abdomen to demonstrate dilatation of proximal, and collapse of distal, loops. Insist on surgical consultation.

● **Pelvic Peritonitis or Abscess.** Usually secondary to inflammatory process involving female reproductive organs, appendix or rectosigmoid. Note rapid sedimentation rate, leukocytosis, and low-grade fever. Perform digital examinations of rectum and vagina followed by proctoscopy and vaginoscopy. Note response to antibiotic before surgical exploration.

## GENERALIZED ABDOMINAL PAIN

The complaint of generalized abdominal pain confronts the physician with his most formidable challenge. Almost any previously mentioned disturbance, responsible for parietal, extra-abdominal or localized intra-abdominal distress, may be of such intensity that the anguished patient responds to the question of "where does it hurt most" with the answer "all over." Particularly is this likely to be true if the afflicted person is excited, high-strung or possessed of a low threshold for pain.

In addition to difficulties arising from lack of subjective localization, the vitally important objective sign of muscle rigidity may be misleading. While generally regarded as indisputable evidence of peritoneal inflammation, it may be present with acute alcoholic gastritis and/or envenomization (black widow spider); and, it may be misleadingly absent in advanced stages of generalized peritonitis ("soft belly peritonitis"). ***"Soft belly peritonitis"*** may be observed particularly in the debilitated or profoundly shocked patient at either extreme of life and/or in those who have been overdosed with sedatives, tranquilizers or opiates.

Sufficiently difficult in the adult male and the nonpregnant, the problem is even more obtuse in infancy and in the gravid. In the former instance, reliance must be placed wholly on physical examination (v.s.); and, in the latter, there are the added difficulties of giving consideration to the complications of pregnancy and of conducting a phys-

ical examination around and/or above the gravid uterus (v.i.).

● **Gastroduodenitis.** Due to dietary indiscretion, gluttony, acute alcoholism, irritant foods, "hot" sauces, drinking iced water while overheated, etc.

● **Phlegmonous Gastritis.** Following accidental or suicidal ingestion of corrosives, caustics, etc. Attempt lavage.

● **Penetration or Perforation of Peptic Ulcer or Gastric Cancer.** Note history of antecedent distress, generalized rigidity, and rebound tenderness. Look for subdiaphragmatic gas bubble on upright scout film. Prepare for urgent surgical intervention.

● **Enterocolitis with Hyperperistalsis and/or Spasmosis.** Due to psychic strain, drastic cathartics, cholinergins, etc. Note response to antispasmodics (belladonna and similarly acting synthetics such as Prantal, Antrenyl, etc.).

● **Perforation or Penetration of Intestines.** As complication of psychosomatic disturbances (regional ileitis, nonspecific ulcerative colitis, etc.), specific infections (typhoid, shigellosis, salmonellosis, cholera, amebiasis, or tuberculosis), diverticulitis, or malignancy. Note rigidity, rebound tenderness, fever, leukocytosis, forward failure, and cyanosis (liberation of serotonin). Beware of "soft belly" peritonitis in aged, debilitated and gravely shocked. Order stool, blood and x-ray examinations (scout film for free gas) while setting up intravenous drip to combat shock and infection prior to a discussion of surgical indications.

● **Intestinal Obstruction.** • Due to ***adynamic ileus.*** Note gaseous distention, tympany, silent abdomen, and response to neostigmine or related cholinergin antagonists. • Due to ***dynamic (organic) ileus.*** Note recurrent spasms of intense pain, audible borborygmi, and step-ladder effect on x-ray films. Prepare for immediate surgical intervention.

● **Fecal Impaction.** Especially in elderly and debilitated (v.i.). Occasionally with spurious diarrhea in which small fragments of inspissated mass are expelled. Add kitchen detergent to enema fluid before attempted digital removal.

● **Acute Hemorrhagic Pancreatitis.** With excruciating pain; profound shock, and, after 8 to 16 hours, elevation of blood and urinary amylase. Look for blue discoloration of abdominal wall (Cullen) or of thighs and flanks (Grey-Turner). Note response to corticosteroids while considering surgical intervention at earliest propitious moment.

● **Primary Hematogenous or Lymphogenous Peritonitis.** Usually from invasion by streptococci, pneumococci, gonococci or colon bacilli. Note generalized rigidity and rebound. Consider abdominal puncture to obtain material for spreads and cultures. If infection appears to be primary, observe response to massive doses of indicated anti-infectives while considering surgical indications.

● **Tuberculous Peritonitis.** With less tempestuous manifestations than in previously mentioned invasions. Look elsewhere (lungs, lymph nodes) for primary focus. Note response to tuberculocides.

● **Secondary Peritonitis.** Due to intestinal penetration or perforation; or to spreading infection from inflamed appendix or gallbladder. Set up intravenous drip to combat shock and infection while giving consideration to surgical indications.

● **Salpingo-Oöphoritis with Secondary Peritonitis.** Examine urethral dis-

charge for gonococci. Note response to anti-infectives but recall that tubal infections and acute appendicitis may co-exist. In doubt, favor exploratory laparotomy (v.s.).

● **Ectopic Pregnancy.** With signs of pregnancy, note absence of uterine enlargement but presence of lateral mass. Prepare for emergency surgery. *See* Pregnancy Complications (p. 299).

● **Septic Endometritis.** With pelvic inflammatory disease. Examine cervix for evidences of illegal abortion (p. 314). Set up intravenous drip to deliver massive doses of anti-infective. Notify local authorities to avoid medicolegal complications.

## ABDOMINAL PAIN IN INFANCY AND CHILDHOOD

The presence of abdominal pain can only be suspected in infancy, and the complaint can be described only imperfectly throughout childhood. Due to this lack of communication, refinements in diagnosis must yield to practical considerations that require primarily a differentiation between the "surgical" and the "nonsurgical" belly.

● **Parietal Disturbances.** Incarcerated or strangulated hernias (umbilical, inguinal, femoral); periumbilical cellulitis (omphalitis, persistent urachus with urinary reflux, persistent Meckel's diverticulum with fecal odor and discharge).

● **Extra-abdominal Disturbances.** Spasmosis and attacks of infantile colic due to vagotonia (p. 216); allergic hypersensitivity to milk, eggs, wheat, gluten, etc. (p. 29); systemic infections (enteric fevers, p. 135); renal infections (especially pyelitis of females, p. 360); metabolic disorders (acidosis, p. 22); porphyrias, p. 38); hemolytic anemias (sickle and target cell, familial hemolytic jaundice, p. 35); Henoch's purpura (note lesions usually over shins, p. 363).

● **Pyloric Stenosis.** Congenital hypertrophy with persistent emesis beginning at 2 to 3 weeks and later becoming projectile. Note palpable mass in epigastrium and visible peristalsis.

● **Intestinal Obstruction.** With vomiting, obstipation and x-ray appearance resembling a stepladder, central to lesion, and collapse distally. May result from incarceration or strangulation of hernia; congenital band; volvulus; twist of loop around urachus or Meckel's diverticulum (look for associated periumbilical cellulitis); or intussusception (blood-red stools, sausage-shaped mass felt abdominally or by rectum).

● **Intra-intestinal Obstruction.** From fecal impaction in Hirschsprung's congenital megacolon. Demonstrate by barium enema.

● **Splenic Rupture.** Following fall or accident (belly-whopping on sled). Spontaneous rupture of diseased and/or enlarged viscus (infectious mononucleosis, reticuloendothelioses, leukemia, etc., p. 334). Note initial pain in left upper quadrant with localized tenderness and rigidity and later development of signs of forward failure and of erythropenia. Exploration mandatory.

● **Cholera Infantum.** With intractable diarrhea and fever but soft abdomen. Note response to intravenous fluids, electrolytes and anti-infectives.

● **Acute Appendicitis.** As frequent as in the adult after the age of 4 years. Note that 16 per cent have associated diarrhea, some from unauthorized doses of laxatives or cathartics, often of the reputedly innocuous "candy" variety. With localized tenderness, spasm and

rigidity, fever, leukocytosis, and rising tachycardia, elect exploratory laparotomy. Risk negligible if adequate hydration is maintained, electrolyte balance preserved, and massive doses of broad-spectrum anti-infectives given preoperatively and postoperatively.

● **Tabes Mesenterica.** With symptoms simulating those of acute appendicitis. Often concomitant with, or following, upper respiratory infection, especially tonsillitis. Probably a direct lymphogenous spread to intraperitoneal nodes. Unless appendix has been removed previously, prefer exploration with appendectomy if no other culpable lesion is revealed. Have excised node examined for evidences of tuberculosis. Have chest x-ray picture made even if evidence is only suggestive of acid-fast invasion.

● **Primary Hematogenous or Lymphogenous Peritonitis.** Usually in the female. Most often pneumococcal (in nephrotics, p. 255), streptococcal (after upper respiratory infection), or gonococcal (examine urethral or vaginal discharge). Consider abdominal puncture. Examine stained spread. If pure culture of gram-positive or gram-negative cocci, treat expectantly with massive doses of broad-spectrum anti-infective. If mixed flora with predominantly gram-negative coliform bacilli, insist on exploration (p. 3).

● **Secondary Peritonitis.** Complicating acute appendicitis or intestinal leakage.

● **Enterocolitis.** With diarrhea (p. 134). Often viral or coccal (straphylococcal or streptococcal "food poisoning"). But may be bacillary (salmonellosis, shigellosis, typhoid, brucellosis, etc.).

● **Poisonings.** Usually from accidental ingestion of acids, ammonia, candy medication (aspirin, phenolphthalein laxative, etc.), ant poison (As, Th, Fl, etc.), mushrooms, canned heat (methyl alcohol), cleaning fluid (carbon tetrachloride), depilatory (Th), household bleach (oxalic acid), drain-pipe cleaner (lye), kerosene, lead paint or dye, mercury bichloride tablets, iodine tincture, moth repellent (paradichlorobenzene), roach powders (As, P, S, etc.), rodenticide (Sb, warfarin anticoagulant, etc.). Induce emesis. By gavage, introduce household antidote (strong tea, milk of magnesia) or universal antidote (2 parts burnt toast, 1 part each of strong tea and milk of magnesia). Prevent recurrence by placing all chemicals, etc., beyond child's reach (*see* Poisonings, p. 292).

## ABDOMINAL PAIN ASSOCIATED WITH PREGNANCY

In pregnancy, the problems engendered by the complaint of abdominal pain are made more difficult of solution by the addition of factors incidental to gravidity; by the presence, within the peritoneal cavity, of the growing uterus; and by a natural reluctance to recommend or perform exploratory laparotomy. Relative to proposed surgery, assurance may be given the patient and her family that the operative risk is not significantly greater than in the state of nongravidity; that the gravid uterus may be expected to cling to its tenant despite necessary manipulations; and that neither anesthesia nor procedure threatens normal fetal development.

● **Special Parietal Disturbances.** Herpes gestationis (with band of hyperalgesia and characteristic versicles); disarticulation of costal cartilages, simulating lesions of right and left upper quadrants (v.s.).