



GENERAL STAFF MEETING
UNIVERSITY HOSPITALS

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ANNOUNCEMENTS:

1. Tumor Conference.

J. C. Litzenberg, Carcinoma of the Cervix, Friday, February 6th, at 11 A.M. Todd Amphitheater.

2. Radio

February, 1931. Wednesday at 11 A.M. February 4. Humidity in the Home; February 11, Control of Diphtheria; February 18th, Treatment of Constipation; February 25th, Cancer of the Uterus. The last Wednesday of each month is devoted to a discussion of some phase of cancer. This is part of the general educational program of the Cancer Institute.

3. Lecture

Clay R. Murray, New York, Assistant Professor of Surgery, Columbia University, will talk at 3 P.M. Thursday, February 5th in Anatomy Amphitheater on Modern Conception of Bone Formation in the Adult and Its Bearing on the Clinical Treatment of Fractures.

4. Mortality Report, January 1931.

I. Malignant

A. Examined

Carcinoma of cecum	52	M
Carcinoma of colon	70	M
Carcinoma of penis	71	M
Carcinoma of prostate	71	M
Carcinoma of stomach	76	F
Carcinoma of stomach	73	M
Carcinoma of stomach	63	M
Carcinoma of stomach	58	M

Ependymoma of brain 45 F

Medulloblastoma of brain 14 F

B. Not Examined

Carcinoma of cervix	66	F
Carcinoma of uterus	73	F

II. Non-malignant

A. Examined

Absence of lung, congenital	6 mo.	F
Anemia, pernicious	50	M
Appendicitis, acute suppurative	67	M
Glomerulonephritis, chronic	38	F
Hydrocephalus, congenital	7 mo.	F
Laceration of throat (Coroner)	61	M
Meningitis, acute (otitis media)	54	M
Pneumonia, pneumococcic	51	M
Pneumonia, staphylococcic	5 mo.	M
Pneumonia, staphylococcic	50	M

Pneumonitis, pleuritis, mediastinitis, pericarditis	13	M
Pneumonitis, pleuritis, mediastinitis, pericarditis	2	M
Prematurity	1 hr.	F
Stillbirth, antepartum	0	M
Stillbirth, prematurity	0	F
Stillbirth, anencephalic	0	F

B. Not Examined

Anemia, type undetermined	60	M
Asthma, bronchial	50	M
Dementia paralytica	35	M
Foreign body, bronchus	3	M
Hydrocephalus, congenital	5 mo.	M
Hypertension, heart (Anatomy)	75	M
Marasmus	3 mo.	M
Meningitis, pneumococcic	11	M
Pneumonia, lobar	5 mo.	M
Sepsis, puerperal	37	F

	<u>Total</u>	<u>Exam.</u>		<u>Total</u>	<u>Exam.</u>
Cancer Gynecology	2	0	Orthopedic Surgery	1	1
Cancer Surgery	8	8	Pediatrics	10	5
Gynecology	1	0	Pediatric Surgery	1	1
Medicine	8	5	Stillbirth	3	3
Neurology	1	0	Surgery	2	2
Newborn	1	1	Totals	38	26
			Deaths		Examina- tions.
			Percentage - 68.6%		

II. ABSTRACTS

1. The Autopsy. Purpose and Technique. O'Brien, W. A., The Northwest Mortician, VI - 12, August 1930.

1. Purpose

1. Is the patient alive or dead?
2. Does contagious disease exist?
3. Is inherited disease present?
4. What was the cause of death?
5. Disciplinary effect.
6. Teaching.
7. To render justice.
8. To unearth scandal.
9. Vital Statistics.
10. Insurance claims.
11. Any rare or unusual disease.

Interest

- Personal
- Public Health
- Family
- All
- Staff.
- Staff and Students
- Society
- Family
- Science
- Family
- Science

- | | |
|-------------------------------------|---------|
| 12. To evaluate diagnostic methods. | Science |
| 13. Scientific discovery. | Science |
| 14. Better embalming. | Family |
| 15. The study of disease. | All |

2. Technique.

- | | <u>Interest</u> |
|-------------------------------------|-----------------------|
| 1. Time of examination. | As soon as possible |
| 2. External examination of body. | Teaching value |
| 3. Internal examination. | Routine |
| 4. Special examinations. | Routine except head |
| 5. Examination of cranial contents. | Special |
| 6. Removal of spinal cord. | Routine if indicated. |
| 7. Restoration of body. | Clean |
| 8. Cooperation. | Necessary |

2. Mills, R.G., Means of Securing Postmortem Examinations, Bulletin of the American College of Surgeons, XIV-40, Dec. 1930.

To secure permission may require much commendable and justifiable effort. The advantages to be gained by all concerned are so great that the end is justified by any honorable means. The same qualifications are necessary in urging examinations, as in advising an operation or a line of treatment.

Who Should Ask?

The person closest to the family. Each case is a law unto itself. The solicitor must be able to secure confidence by natural sympathy. Some men are unable to do this. Their minds are so imbued with the technical phase of their work that they have almost lost contact with humanity as far as emotions are concerned. There should be a hospital rule that no certificate of death is signed until someone interviews the relatives. There should be either permission or final refusal (Note - Such a rule exists in the University Hospitals by common consent of all concerned. The violation of this rule is not in keeping with our desire to improve ourselves and our service to patients. Our personal feelings are secondary and should never be allowed to enter into the matter.)

Mental Attitude of Solicitor.

1. Pleasant task ahead. (Knowledge of satisfaction to be brought to relatives).
2. Determination to succeed. (Personal satisfaction).
3. Freedom from personal responsibility for outcome. (Real or assumed).
4. Conscious that he is applying the principal of the Golden Rule (Asking for something he would permit to be done to a member of his own family).
5. Conviction he is approaching relatives in spirit of true helpfulness. (Really believes he is offering something they should have and is willing to try to convince them of this need).
6. Knowledge of case sufficient to permit discussion of intimate details. (The common meeting ground - the final illness - the family are engrossed with it and expect every physician to be the same).
7. Deep interest in family. (They are his brothers and sisters deep in grief, needing comfort and consolation. He can supply them with that absolutely necessary information and explanation which will contribute to their later peace of mind.)

Technique.

1. Offer of assistance (trains, telegrams, selection of undertaker, social service, etc.)
2. Death Certificate (to be carried for the purpose of getting information, and reference to possibilities of insurance, legal records, etc.)
3. Permission.
 1. Size up family for direct or indirect approach.
 2. Establish confidence by discussion of illness.
 3. Select details vague and uncertain in their minds and arouse curiosity.
 4. When time approaches calmly announce all above points can be settled only by an examination (offer, not request).
 5. Truthfully state that examinations are made in practically all cases.
 6. It is a privilege to have it done at the University Hospitals because of unusual opportunities offered; not a privilege granted to others.
 7. Additional service made without charge.
 8. Watch for external signs of disagreement and keep control of conversation.
 9. Then rest case with jury.
 10. Close and change the subject after permission has been received.

Avoid

1. Postponing scheduled time of interview.
2. Postponing scheduled time of examination (very important. Fix as soon as possible).
3. Use of sterums (postmortem on necropsy) examination to be used.
4. Haste - you have come for a specific purpose.
5. Antagonizing, quarreling, or disputing with relatives. Do not extend interviews too long. Call someone else before they become irritated.
6. Eagerness (counteracts statement of purpose of examination for family).
7. Excessive words (the less said the better).
8. Too many details about the nature of the examination. Have them understand in simple language what it is to be. Protect yourself and others.
9. Idea of evisceration. Admit that a certain amount of cutting is necessary but so is this in embalming.
10. Impromptu places for interview (use a room).
11. Talking to group if possible to select one. Try to impress upon one that he is the responsible member of the group and must convince them, if necessary.
12. Use of interpreter. Use solicitor who speaks native tongue.
13. Request for examination before death except under very unusual circumstances. Prepare way by beginning the discussion of unusual phases, not quite clear, etc.
14. All idea of cancelling bills, or arranging fees of undertakers because of examination.
15. Permission for a partial examination unless a complete examination is impossible.
16. Allowing relatives to be present unless absolutely necessary.
17. Quarreling with undertaker (most of our men are positively favorable).
18. Threats if examination is not allowed.
19. Religious arguments. Call someone of relatives' faith if this objection is met.
20. Rash promises as to possibility (remember relatives are more interested in facts which may be brought to light which concern them: not so much the benefit to science and humanity, although the latter may be used as an excuse to cloak their feelings).

(To be continued)

III. CASE REPORTS

I. ACUTE PNEUMONIA, UNILATERAL EMPYEMA, SUBPLEURAL ABSCESS OF LUNG.

The case is that of a white male 4 years old admitted to the University Hospitals 12-5-30 and died 12-11-30 (6 days).

11-28-30 Acutely ill. Manner of onset not stated. Pain in right chest. Fever, increasing cyanosis and dyspnea. Grew progressively worse. Illness presented many diagnostic problems early in course.

12-5-30 Admitted to the University Hospital at 2:30 A.M. 7th day of illness. Coughing. Rapid and shallow breathing. Cyanosis and weakness, moving ala nasae, limited motion, fullness of right chest. Loud bronchial breathing lower 2/3 right chest. X-ray shows dense shadow obliterating almost the entire right chest (massive effusion). Displacement of heart, trachea and mediastinum to left. Small part of upper lobe of right lung visible shows no disease. Dense shadow with convex border from upper portion of superior mediastinum to infraclavicular region (enlarged glands?). Left lung clear. Diagnosis: Massive right pleural effusion. Secondary displacement of contents of mediastinum, mass of glands in right superior mediastinum. Hb. 90%, WBCs 33,250, P 91, L 6, M 3. Occasional normoblast. Urine - trace of albumen. Numerous granular casts, few hyaline casts, clumps of pus.

10:15 A.M. Closed drainage of right pleural cavity by puncture of 9th intercostal space in the right side, posterior axillary line 40 cc. purulent fluid withdrawn. Respiratory difficulties developed during process, relieved by clamping tube and oxygen inhalation. 2:00 P.M. 300 cc. withdrawn. 4 P.M. Suction started. Following drainage painful cough became considerably worse. Restlessness, irrational, excessive perspiration, grunting respiration. Fowler's position. Codeine sulphate, oxygen off and on. T 102-104.2, P 140-168, R 46-60. High caloric diet.

12-6-30 Drainage stopped. Restless, dyspneic. Drainage started (200 cc.). Coughed a little. Takes fluids well. Brassy cough (painful) started. Oxygen inhalation. Dakin's irrigation of chest. Pulse thready. Codeine sulphate caffeine sodium benzoate, and adrenalin. Condition not good. T 103-104.2, P 140-160, R 40-50.

12-7-30 Not responding well. Pulse weaker. Labored gasping (air hunger). Irrational, restless. 175 cc. thick, purulent exudate through drainage bottle. Involuntary urination. Emesis. Hypodermoclysis 500 cc. normal saline. Codeine sulphate. Irrigation of chest. T 103-105.8, P 150-160, R. 40-60.

12-8-30 Respiratory difficulties continue. Irrigation of chest normal saline and Dakin's. Condition practically unchanged. Oxygen tent. WBCs 14,000. X-ray showed same findings except for probable bronchopneumonia on the right. General condition fair at times. A few rales developing in left chest. Slight air leakage about drainage tube, replaced without difficulty. T 104.2-105.8, P 150-170, R 40-50.

12-9-30 Drainage and irrigations continued. Caffeine sodium benzoate, atropine sulphate for mucus in throat. 300 cc. 10% glucose intravenously. Hypodermoclysis. Twitching of left hand at times. Very restless. T 102.2-106.4, P 130-160, R 30-40.

12-10-30 Condition is slightly improved. Glucose intravenously. Then became worse. Tremor of left hand and toes. Slight of right hand. Cyanosis. T 101.8-106.2, P 130-160, R 25-40.

12-11-30 Weaker, cyanotic, failing rapidly. T 108, P 130-160, R 18. Several convulsive seizures. Pulse remains strong up until after respirations stopped.

Autopsy - Examination of the peritoneal cavity showed a fibrinous, cloudy, yellow ascitic fluid 200 cc. in amount, the loops of bowel were adherent with the fibrinous exudate. All adhesions apparently being early in nature.

Examination of the pleural cavities revealed a subpleural abscess 2 cm. in diameter on the right lung. The left pleural cavity appeared entirely normal.

The right visceral pleura was also covered with a fibrinous exudate and there were multiple early adhesions between the visceral and parietal pleura. The pericardial sac was adherent to the chest wall anteriorly but appeared otherwise normal.

The right lung weighed 260 grams, the left 160 grams. There was definite enlargement of the hilus lymph nodes on the right and the right lung was considerably swollen and edematous, but no consolidated areas were demonstrated. There was no pus and the color appeared normal. The left lung was entirely normal. The lower lobe of the right lung presented multiple abscesses 1-2 cm. in diameter.

DIAGNOSIS:

1. Acute pneumonia (right).
2. Subpleural abscess of right lower lobe.
3. Right empyema.
4. Closed drainage.
5. Acute fibrino-purulent peritonitis.
6. Acute lymphadenitis (right hilum).
7. Cloudy swelling of heart, liver and kidneys.
8. Multiple puncture wounds.

II. ACUTE SUPPURATIVE PLEURITIS, PERICARDITIS AND MEDIASTINITIS. PULMONARY ABSCESS AND ATELECTASIS.

The case is that of a male child, age 2, admitted to the University Hospitals 12-27-30 and died 1-16-31 (20 days).

12-17-30 - Patient ate some hard, Christmas candy and began to choke and cough. Later the cough improved.

12-21-30 Became suddenly ill with fever and restlessness. A physician was called who found both ears bulging and red and a T. of 103°.

12-26-30 Developed rapid, shallow breathing. A physician saw him who states that the breathing was rapid and shallow. Rales in both lungs with marked dullness on the right and stated that the heart was on the right.

12-27-30 Admitted to the University Hospitals.

Past History - not recorded.

Physical examination - Well developed and nourished male child 2 yrs. of age lying in bed breathing rapidly with a definite expiratory grunt. Cyanosis is present and there is a retraction of the alae nasae and intercostal spaces. The ear drums are reddened and there is slight cyanosis of lips. There is a moderate rigidity of the neck. Anterior and posterior adenopathy. The chest showed slight impairment of motion on the right and impaired resonance on the right. Over this area the breath sounds were increased. Distant bronchial breathing and a few moist rales were heard. The diaphragm was high on the right side. The left chest was hyperresonant. A few coarse rales were heard. Heart 168, tones were clear. Soft, systolic murmur present. Abdomen distended, tense and tympanic.

Laboratory - Urine - Negative. Hb. 92%. WBCs 28,200. Pms 92, L 8.

X-ray - 12-27-30 - Diffuse density of irregular character throughout the right chest. There is a dense area of consolidation or fluid between the upper and lower lobes and some evidence to suggest atelectasis. The right diaphragm is higher than normal. The heart is pulled over to the right and shows a very abnormal form suggesting some type of congenital deformity. Films that were made on 12-29-30 show marked change since last examination. This shows a tremendous mass in the superior mediastinum extending down over the heart on both sides. Suggests a thymus but rapid enlargement would rule this out. Possibility of atypical pericardial effusion cannot be ruled out. There is evidence of fluid in the left base extending up along the margin of the lung suggesting empyema. There is also evidence of slight amount of fluid in the prepleural cavity on the left.

Conclusion - Bilateral empyema. Probable mediastinal abscess (left). Encapsulated lobar empyema. The possibility of a foreign body in the trachea with perforation and many secondary changes appear to be present.

Temperature 103.8. Respirations 40. Pulse 176. Chloral hydrate gr. V every 3 hours x 3. Noble's enema 1/2 strength with expulsion of liquid feces. Breathing is heavy and labored. Involuntary urination. Oxygen 1 hour.

12-28-30 Forenoon - Condition about the same except for cyanosis of the finger nails. Continuous oxygen given with some relief. Tepid sponge. Afternoon - Patient seemed restless. Chloral hydrate gr. V every 4 hours x 3. Tepid sponge given. 700 cc. normal saline with 5% glucose given subcutaneously. The abdomen is very distended. T. to 105, P. to 178. R. 48. Urinary incontinence noted.

12-29-30 Condition about the same. Amytal gr. 1 1/2 x 2 for restlessness given. Alcohol sponge given. Chloral hydrate gr. X. Involuntary urination noted. Oxygen discontinued and steam inhalations begun T. to 104.5 P to 180, R to 75. Fluid intake 1300 cc.

12-30-30 Condition is about the same. About 5 A. M. patient became suddenly cyanotic pulse irregular and weak. Steam inhalations were discontinued. Oxygen started. Given caffeine sodium benzoate, gr. II for relief. Alcohol sponge given. Involuntary urination. Digalen mm. II and caffeine sodium benzoate gr. II given. 300 cc. 10% glucose per vein. Triple bromide gr. X and chloral hydrate gr. V given. Seemed slightly improved in the afternoon. X-rays show no change in the findings from the preceding films.

12-31-30 The condition seems worse. Has attacks of cyanosis. Seems to be choking. Relieved by steam inhalation. Very restless. Tepid sponge given. Diarrhea with pain noted. Involuntary urination. Steam inhalations discontinued. Oxygen started. Chl. hy. gr. V. Hypodermoclysis with 2% glucose started. Refuses all fluids by mouth. Nasal gavage 500 cc. normal saline, 20 drops per minute. In the afternoon the patient seemed more stuporous. Respirations became more shallow. Caf. sod. benz. gr. III, digalen xx. mm. III, and oxygen started. T. to 103.8. P to 180. R. to 60. Fluid intake 1800 cc.

Laboratory Hb. 92%, WBcs 28,200, Pmns 92%, L 8%

1-1-31 Patient seems better in the forenoon. Steam inhalations and oxygen were given. Urinary incontinence noted. The scrotum was red and painful. Hot packs applied. Normal saline 500 cc. by nasal gavage given. Slight edema of the face noted. Chl. hyd. gr. V. Involuntary urination and defecation. T. to 103.6, P. 180, R 55. 1550 cc. fluids.

1-2-31 Condition of the patient seems to be about the same. Pulse weak and respirations shallow. Involuntary urinations and defecations. Patient is more cyanotic. Urine is negative. X-ray shows increase in the mediastinal mass. T. 102.2, P. 170, R 52. Intake 560 cc.

1-3-31 Patient seems brighter. Cyanosis noted when oxygen tent is removed. Restless and chl. hyd. gr. V given x 2. Abdomen is distended. Given tap water enema and hot turpentine stupes to the abdomen with good results. T. to 102, P 160, R 45. Intake 350 cc.

1-4-31 Patient is about the same. Chl. hyd. gr. V x 4 for restlessness. T. to 100.6, P. to 150, R. 30.

1-5-31 Condition is definitely worse. Blood cultures show staphylococcus. Difficult breathing noted. Caf. benz. gr. II. adrenalin mm. 3 and atropine sulphate gr. 1/300 given. Continuous oxygen instituted. 500 cc. 5% glucose and saline subcutaneously given. Thighs becoming edematous. Chl. hyd. gr. V for restlessness. 60 cc. 10% glucose per vein. Nasal gavage 100 cc. 10% glucose and milk 350 cc. Thoracentesis, left 125 cc., thick yellowish fluid. Right side 35 cc. thick brownish fluid. In the afternoon an additional 100 cc. of thick yellowish fluid removed from the chest. T. to 104, P. 170, R. 62. Intake 1090 cc.

1-6-31 Condition about the same. The abdomen is distended. Tap water enema given with results. Thoracentesis 50 cc. thick yellowish pus removed from both chests. Nasal gavage. T. to 104, P. 158, R. 45. Urine negative. Continuous oxygen.

1-7-31 Continuous oxygen was given. Chl. hyd. gr. V for restlessness. Thoracentesis right and left side 60 and 50 cc. respectively of thick yellowish pus obtained. Nasal gavage. Coughs a great deal and seems to have mucus in his throat. The abdomen is distended. Enema given with good results. T. to 103.8, P. 160, R. 65. Intake 950 cc.

1-8-31 Condition is about the same. Chl. hyd. gr. III for restlessness. Oxygen continued. Thoracentesis right and left 35 cc. and 135 cc. pus obtained respectively. Nasal gavage. Egg nog and milk given. Numerous stools were noted. X-ray Considerable degree of collapse of the left lung. Marked adhesions present at the base of the periphery. These adhesions are in the region of the old bronchiectasis and portion of the lung is probably not yet collapsed. Conclusion Pneumothorax, Pleural adhesions. Another x-ray taken the same day shows a mass in the superior mediastinum has decreased considerably in size since the last examination. Fluid in both pleural cavities. Encapsulated inter-lobar effusion on the right is still shown. Conclusion - Probable mediastinal abscess decreasing. T. to 103, P. 160. R. 48.

1-9-31 Numerous stools were noted. Patient very restless and given chl. hyd. gr. III. The abdomen is distended. Given tap water enema and turpentine stupes with fair results. Some flatus is expelled but distention is still present. Tap water enema is given again. Noble's enema (modified) 500 cc. with poor results. Noble enema with pituitrin mm. III with good results. Thoracentesis right and left removed 20 and 70 cc. respectively. T. to 103.4 P. 170, R 50. Fluid intake 790 cc.

1-10-31 Condition is about the same. Chl. hyd. given for restlessness. Boric acid ointment to buttocks. Nasal gavage t.i.d. Right and left chest aspirated and 40 and 170 cc. obtained respectively. Numerous stools were noted. Transfusion of 200 cc. of blood and 200 cc. normal saline per vein. The abdomen is distended and patient is given modified Noble's enema with pituitrin with fair results. Laboratory Hb. 61%, RBcs 3,320,000, WBcs 8,650. T to 104, P 170, R 50. Intake 1125 cc.

1-11-31 The oxygen is continued. Chest is aspirated 20 cc. from the right, 100 cc. from the left side. Numerous stools were noted. Patient is cyanotic. Caf. sod. benz. gr. III, digalen mm. 3 x 2 given. The abdomen is distended. Modified Noble's enema with turpentine stupes and pituitrin mm. III given with good results. T to 105, P 170. R 48. The patient is still incontinent. Intake 840 cc.

1-12-31 The patient was noted to be very cyanotic and pulse weak. Continuous oxygen given. Chest aspirated and 150 cc. from the left side. Nasal gavage. Laboratory Hb. 70%. RBcs 4,140,000, WBcs 8,600. T 103.2, P 164, R 45. Intake 850 cc.

1-13-31 Abdomen is soft. Numerous watery, foul-smelling stools were noted. Chest aspirated and 150 cc. from the left side and 50 cc from the right side were obtained. Caf. Sod. benz. gr. II. X-ray Still a moderate amount of fluid at the right base. Small amount of fluid at the left base with air above this. There is a considerable density at the base of the right upper lobe. The left lung seems clear. Shadow at the mediastinum is considerably wider. The cardiac shadow is widened and the possibility of a pericardial effusion must be considered. T to 103.2, P 170, R 50.

1-14-31 Condition is worse. Patient is very cyanotic. The pulse is weak. Caf. sod. benz. gr. III x 5. digalon mm. 3 x 2 given. Numerous yellow stools were noted. Continuous oxygen. Thoracentesis of 120 cc. left chest. Bilateral

myringotomy performed and slight pus obtained. Zinc oxide applied to buttocks.
T 104.8, P 180, R 45.

1-15-31 Patient's condition is now very poor. Continuous oxygen instituted. Patient is very cyanotic and pulse is poor. Caf. sod. benz. gr. II, digalen mm. III x 4, chl. hyd. gr. III given. Chest aspirated and 30 cc. obtained from both sides. Frequent stools noted. Bilateral myringotomy and pus obtained. Nasal gavage. Pus from the ear probably staphylococcus with a mixture of streptococci. T. 103, P 170, R 42.

1-16-31 Patient is very cyanotic and dyspneic. Does not respond. Caf. sod. benz. gr. III, adrenalin mm. II, digalen III given. Died 3:30 A.M.

Autopsy Both pleural cavities contain a large amount of thick, yellow, to cream, purulent exudate. There is partial pocketing of the pus on both sides. When the hand is passed down into the pleural space, thick and thin purulent exudate is liberated. The pericardial sac is adherent to the pleura and to the anterior chest wall by recently formed adhesions. When the pericardial sac is opened, there is a large collection of exudate similar to that seen in the pleural cavities. This is located to the right of the sulcus, between the ventricles. There is an area over the anterior surface of the left ventricle which is free of exudate because of adhesions. The mediastinum shows thickening and a collection of pus in the upper portion of the pericardial sac surrounding the great vessels, the sulcus between the left lung and the mediastinum, where a large collection is found, and to a slight extent on the right side. There is no pus in the posterior mediastinum. When the lungs are liberated they are covered with exudate which varies from watery fluid to cheesy material.

The lungs weigh 180 grams each. The pleural surfaces are irregularly covered with exudate. On section no definite pneumonic areas are seen. In the right lower lobe, just beneath the pleura, there is a small collection of pus (abscess). Throughout both lungs, but especially on the right side patches of atelectasis are present. There is moderate congestion but no edema.

DIAGNOSIS:

1. Acute pneumonia (clinical)
2. Acute otitis media
3. Bilateral empyema
4. Purulent pericarditis
5. Left mediastinal abscess
6. Cloudy swelling of liver and kidneys
7. Acute splenitis
8. Pulmonary atelectasis (patchy)
9. Abscess, right lower lobe
10. Edema of gallbladder
11. Congestion of trigone of bladder
12. Gaseous distention of intestines and stomach
13. Superficial puncture wounds
14. Abrasions and ecchymoses
15. Operation scar, right antecubital

COMMENT: Onset suggestive of foreign body (candy), i.e., choking followed by a pulmonary infectious process (4th day). The x-ray findings of bilateral empyema on the 6th day of illness were (suggestive), on the 8th day (absolute), indicating probable synpneumonic empyema (unfavorable prognosis). The mass in the left mediastinum was verified at autopsy as an abscess. No perforation of trachea or bronchi was found. The displacement of the heart to the right

noted clinically (5th day) and with the x-ray (6th day) was probably due to abscess between the lungs and the pericardium (left of the mediastinum). The element of pericarditis might also have entered into it. Pericarditis was considered on the 1st and 18th days (x-ray). Gaseous distention was persistent and troublesome (ileus with extra pulmonary gas exchange). This was followed by frequent loose stools (parenteral infection?). The violence of the infection is indicated by the extreme restlessness, hyperpyrexia, tachycardia, stupor, involuntary urination, diarrhea and early appearance of wide-spread exudative inflammation. Obstructive respiratory signs were also marked. It is not apparent from the records that the repeated aspirations (because of rapid reaccumulation of exudate) influenced the course of the illness very much. The early appearance of signs of otitis media (redness and bulging) with the late appearance of pus is of interest. Note that the case corresponds to the sex, age, fulminating infection bilateral disease with unfavorable prognosis. The finding of a subpleural abscess at the apex of the right lower lobe is in accord with the statement that empyema results from rupture of such abscesses following pneumonic processes or during their course.

III. CHRONIC PNEUMONITIS (ABSCESS), PLEURITIS, MEDIASTINITIS, PERICARDITIS (PICK'S DISEASE)

The case is that of a white youth, 12 years of age, admitted to the University Hospital 9-25-30 and died 1-19-31 (96 days).

1929 - (Summer) - Bronchopneumonia - 6 - 8 weeks.

1930 - Fatigue all summer. Had paper route. Too tired to play.

July - Pain in right side. Daily fever of 101 to 102°. In a few weeks he had a productive cough with foul yellow sputum - oz. 1 daily. Precordial pain lasting 20 hours. Frequent epistaxis. Poor appetite. Chest negative on physical examination. X-ray Chest - questionable scar at right base. Widal positive 1-50. No rose spots, no splenomegaly, no T.B. in sputum. Von Pirquet negative.

August - Chest X-ray - Density at right lower base. WBCs 20,000, Pmns 70.

Urine negative. Widal positive 1-200. Appetite poor. Parents allowed child up. B. Mellitensis and abortus negative.

September 11 - Dullness at right base. Increased breath sounds anteriorly and posteriorly. Later decreased breath sounds.

September 22 - Increased cough. Suggestion of precordial friction rub. Pulse 150. Heart examined by physician. Said to be negative.

September 25 - Entered University Hospital with same complaints as given above.

Physical Examination: Acutely ill white male child with flushed cheeks and dry, warm skin. Head and neck - a few carious teeth present. Submaxillary glands palpable. Chest - Lagging of right chest, slight bulging of precordium. Litten's sign absent on right. Lungs - Tactile fremitus absent below 3rd interspace anteriorly and below angle of the scapula posteriorly. Breath sounds and vocal fremitus absent over right base. Heart - Diffuse apex beat. Dullness to left anterior axillary line. Saccular type of enlargement. Definite precordial friction rub. Abdomen - Liver palpable 2 fingers below costal margin.

Laboratory - Hb. 60%. RBCs. 4,060,000, WBCs 22,050. Pmns 86, L 13, M 1.

Blood culture negative. Mantoux 1 - 100 negative. Urines - (99 different specimens essentially negative except for occasional red or white). Pleural

Fluid - (Thoracentesis) - clear, greenish, yellow fluid. No coagulation.

Sp. gravity 1014. Cells 17,580. L 70, Pnns 30. No bacteria. Guinea pig inoculation negative.

X-ray Bilateral pleural effusion. Cardiac enlargement - undetermined type.

Ice cap to pericardium. Codeine P.R.N. for cough.

9-26-30 Transfusion of 250 cc. citrated blood. Blood culture negative. S. S. enema good results. P. 80-130. T. 100-102.

9-27-30 T 104. Friction rub less marked. Pain in abdomen.

9-29-30 Friction rub disappeared. Chest x-ray Smaller amount of fluid on the right than before. Otherwise same. T. 100.6-101.6.

10-2-30 Hb. 75% (60% before transfusion). WBcs 17,700, RBcs 4,180,000. P 67, L 23, M 8, E 2. Thoracentesis - culture and guinea pig inoculation negative. Mantoux 1-200 negative.

10-3-30 Chest x-ray Slight decrease in effusion on right; otherwise same as 9-29-30. Transfusion of 250 cc. blood. Comfortable.

10-6-30 Uncomfortable because his bowels haven't moved. S. S. enemas have been necessary since he had typhoid (?). S. S. enema with good results. Chest x-ray Slight decrease in effusion on right again. Otherwise same.

10-7-30 Hb. 75%, RBcs 4,500,000, WBcs 19,000.

10-8-30 Complains of food sticking in throat. Ate no supper. T still running 100-101°. P. 90-130. Blood culture still negative.

10-10-30 Atropine drops V. (1-1000 t.i.d. a.c.) Sodium bicarbonate gr. viiss, t.i.d. a.c.

10-12-30 Nauseated after eating. Transfusion of 150 cc. blood. Petrolagar oz. ss, every H.S.

10-14-30 X-ray of chest About same as before, plus parenchymal pathology in both bases.

10-15-30 Orange juice and 1/2 yeast cake b.i.d. Nauseated and does not eat much. Hb. 65, RBcs 3,900,000, WBcs 17,500. P 78, L 17, M 5. Lethargic. Seems in poor condition.

10-17-30 Emesis once. Very quiet. X-ray Esophagogram shows no displacement or compression of the esophagus in region of left atrium. Appetite poor. T. 100-102°. S. S. enemas for bowel every few days. Soda bicarb. and atropine stopped. Liver extract vials 1 b.i.d. begun.

10-22-30 Wassermann - State Board negative. Larson Positive. X-ray G.I. study. Obstruction at distal end of esophagus just at entrance to cardia extending about 1 cm. above diaphragm. Suggests cardiospasm but extent and incomplete closure is against this. Possible stricture from mediastinal adhesions. Suggest re-examination after antispasmodic.

10-25-30 Blood culture of 9-25-30 shows gram positive cocci, single and in pairs. Vomits medications.

10-27-30 G. I. x-ray - Unsuccessful as patient was unable to take barium meal. Pain in stomach. Emesis of food occasionally. Uncomfortable.

10-29-30 300 cc. Transfusion. Refuses liver. Emesis continues. Nasal tube feeding instituted. 300 cc. retained. Mantoux negative. T. 100-102 daily.

10-30-30 Gastric lavage. 75 cc. retention. Gavage feeding retained but nausea follows procedure.

10-31-30 X-ray Barium by stomach tube. Negative stomach, dilated duodenum.

11-1-30 Lavage and gavage. Very uncomfortable generally. Hb. 85, WBcs 21,750, P 120-130, T 100-101 (lower now).

11-7-30 Chest x-ray Right pleural effusion, with adhesions to diaphragm. Possible infiltration of right base.

- 11-11-30 300 cc. citrated blood intravenously. Nausea still troublesome.
Refuses to eat. T 100-102. P. 100-130.
- 11-12-30 X-ray Right maxillary and ethmoidal sinusitis.
- 11-14-30 Hb. 83%. Appetite improving.
- 11-17-30 Emesis
- 11-19-30 Expecterated large amount of mucus containing small amount of food.
- 11-20-30 Lungs are clearing. Two feedings between meals. Seems brighter.
- 11-21-30 T. to 103 today but seems better.
- 11-23-30 Pleural fluid negative (State Board animal innoculation for T. B. negative) No complaints.
- 11-24-30 Chest x-ray Chest negative. Esophagogram. Density and irregularity at left base, represents probably a diaphragmatic pleurisy with a lower respiratory infection. Large right pleural effusion.
- 11-25-30 Hb. 80%. RBcs 4,690,000. WBcs 20,100. Good day.
- 11-26-30 Blood streaked sputum. T. 100-102.8. P. 120-140.
- 11-28-30 Pain in chest. Friction rub on left side.
- 11-29-30 Chest-x-ray Pleural effusion as before on right. Mottling suggests parenchymal involvement. Some, but less marked on left. May be thickened pleura. Pulmonary congestion - both bases.
- 12-4-30 To dentistry for reading and prophylaxis. Good day.
- 12-5-30 Pain in left side. 46 cc. blood injected subgluteally. Stomach upset. Feels weak. T. 101-104. P. 140.
- 12-6-30 Emesis twice. Ice cap to lower thorax.
- 12-8-30 Emesis once. No complaints. Sleeps soundly.
- 12-9-30 Thoracentesis (20 cc.). WBcs 1700(?). Staph. on culture. T 99-102.8, P 120-130.
- 12-10-30 Nausea and vomiting.
- 12-12-30 Complains of cold feet and back.
- 12-15-30 Expecterates a good deal.
- 12-16-30 Takes solid foods better than liquids! Ankles both edematous and painful at times.
- 12-17-30 Appetite poor.
- 12-18-30 Right foot and ankle very edematous. Left foot somewhat swollen. Ate large breakfast. Hot water bottle to right foot for pain.
- 12-19-30 Stomach ache from liver extract.
- 12-21-30 Stomach ache again. Listless.
- 12-22-30 Right leg very tender. Drowsy and irritable.
- 12-23-30 Right ankle and thigh more edematous. Picks at nose.
- 12-24-30 Expecterates a good deal. Fair day.
- 12-25-30 Pain in left side of thorax. Cheerful.
- 12-28-30 Flushed. Pulse rapid and thready. T 104 at times. P 150. Pain gone.
- 12-31-30 X-ray 6' heart, esophagogram. Stenosis of esophagus extended up a slight degree but there is marked relaxation of cardiac orifice now, with rapid emptying of esophagus. Heart smaller, but still large. Fluids at both bases with increase on right-bilateral effusion. Marked infiltration of lung on right side posteriorly behind heart, especially. Suggests chronic fibrosis as in unresolved pneumonia or in bronchiectasis.
- 1-2-31 Hb. 51%. Pain in stomach when coughing.
- 1-3-31 225 cc. citrated blood intravenously. Thoracentesis 20 cc. blood tinged.
- 1-7-31 No growth on culture of pleural fluid. X-ray - No change since last examination. Unable to eat. Pain in abdomen and right side of chest. Moans in sleep. Coughing. T - 99 - 103.

- 9-31 Schick test - no reaction.
13-31 Right leg elevated. Light cradle.
14-31 Size of previously enlarged abdominal vessels decreased.
15-31 Pain in abdomen.
16-31 Pulse rapid. Face flushed.
17-31 X-ray - Acute maxillary sinusitis on left, chronic max. sinusitis right. T. going up from normal to 103 in the last week.
18-31 Codeine gr. ss. Coughs a great deal and expectorates more.
19-31 Hb. 39%. RBCs 2,100,000. Pain in abdomen. S. S. enema. Highly colored results. Abdominal distress and is slightly nauseated. Refuses to eat. Listless and weak. Responds fairly well. Mother attempted to elevate patient on pillow. Expired suddenly at 2:17 P.M. T. 100.

AUTOPSY: The subcutaneous fat is scanty in amount. There is approximately a liter of cloudy yellow fluid containing flakes of fibrin in the peritoneal cavity. The omentum is rolled up under the stomach. The intestinal coils are injected. There is a marked edema of the peritoneum and the tissues lateral to the lower thoracic region. The diaphragm is at the 4th rib on the right, 4th interspace on the left. The appendix is subcecal and free. The gall-bladder is distended. The liver extends 3 cm. below the costal margin on the right midclavicular line 8 cm. below the angle of the xiphoid, is at the costal margin on the left.

When the chest plate is removed dense adhesions are found between the structures of the anterior mediastinum and the wall. There are firm fibrous adhesions in the right lower thoracic cavity and a few on the left. The dense adhesions are found in the right lateral thoracic space and between the lung and the mediastinum on both sides. There is approximately 1/2 liter of yellowish fluid in the right pleural cavity and the same on the left. The fluid is thin and yellowish brown in color and different from the peritoneal fluid in this respect. There are adhesions between both lungs in the diaphragm. There is a collection of cheesy material below the diaphragm in the midline extending to the left but not to the right. The collection is to the left of the liver. There are multiple firm, fibrous adhesions between the liver and the diaphragm. Pus is encountered deep within the peritoneal cavity to the left of the liver. There is a collection of greenish yellow, granular material between the pericardium and the left lung. Portions of the pericardial sac is separated from the diaphragm and discloses similar exudate to that seen on the left side. The pericardial sac is densely adherent to the heart and on the left side a collection of dry exudate similar to that seen elsewhere is found.

The heart is next lifted up and a careful study made of the region of the esophagus at the diaphragm. A probe passes through without difficulty and there is apparently no involvement of the mucus membranes. An attempt to pass the finger, however, meets obstruction. This is due to a dense, fibrous mass of tissue around the esophagus and in the posterior mediastinum. The same condition is found on the right obstructing the inferior vena cava. While a probe can be passed, there is definite interference with the lumina. The vena cava (inferior) below this is opened and a large thrombus is found extending down to the bifurcation of the iliac. The heart weight 140 grams.

The surface is roughened due to adhesions. A careful study made of the valve edges reveals no disease. The muscle is cloudy and soft and there is no evidence of anomaly. The root of the aorta shows a few yellowish plaques.

The right lung weighs 420 grams, the left 400. The surfaces are both roughened due to adhesions. Longitudinal sections through these reveal the following changes: there is a subpleural hematoma in the upper lateral portion of the right upper lobe 2 cm. in diameter. Throughout both lungs and especially on the left, there are multiple dark red, small infarcts (?). The right lower lobe shows dense, fibrous changes suggestive of an interstitial change. Similar changes are present on the left side but they are not so marked. In addition, there are raised, nodular areas of greyish red consolidation from purulent exudate can be expressed (solid and cystic).

DIAGNOSIS:

1. Chronic pneumonitis (cornification)
2. Multiple pulmonary abscesses (solid and cavitation)
3. Chronic, suppurative and proliferative pleuritis, mediastinitis, pericarditis and peritonitis (subphrenic and porta hepatis (adhesions)).
4. Obstruction of esophagus and inferior vena cava.
5. Chronic maxillary and ethmoid sinusitis (clinical).
6. Obstructive varices (abdominal Wall) with thrombosis.
7. Edema of lower half of body (subdiaphragmatic)
8. Thrombosis of inferior vena cava.
9. Acute fibrino-purulent peritonitis.
10. Bilateral hydrothorax
11. Passive congestion of spleen, liver and kidney.
12. Hyaline perihepatitis.
13. Lymphadenopathy, (abdominal, mediastinal, and peribronchial).
14. Puncture wounds.

COMMENT: Onset of illness was bronchopneumonia? summer of 1929. Never recovered. Exacerbation July 1930, probably due to chronic pneumonia (abscess and bronchiectasis). Pericardial friction rub September 1930. Early thoracentesis revealed high white count, but not typical exudate. Taps were repeatedly negative for tubercle bacilli. X-ray finding of bilateral effusion and change in cardiac shadow at early opportunity for examination. Fluid fluctuated repeatedly as well as clinical signs. Obstruction in mediastinum (food sticking in esophagus) was demonstrated at autopsy to be due to mediastinal adhesions (x-ray diagnosis). There was only one positive blood culture (gram positive cocci). Note flare-up of chronic sinusitis which is usually a part of the picture of lower respiratory infection. Development of venous obstruction (peripheral edema of the lower extremities) occurred 12-18-30. The collateral circulation (of the abdominal wall) which later was thrombosed, was noted at a later date. Abdominal pains and signs of distress (peritonitis and thrombosis of inferior vena cava followed by suggestive signs of pulmonary embolism) were due to stasis and infection. The entire course was marked up by chronicity and exacerbation. This is undoubtedly a case of Pick's disease on a non-tuberculous basis. Suggestion that it was due to rheumatic fever has been made.

IV. ABSTRACTS

1. Pneumonia in Childhood.

Abstract - McNeil, C., MacGregor, A. R., Alexander, W. A., Arch. of Disease in Childhood, 4-12, Feb. 1929. From the Royal Edinburgh Hospital for Sick Children, and the Royal College of Physicians, Edinburgh.

Type of approach

1. Clinical aspects
2. Morbid anatomy and histology (large thin paraffin sections of entire lung).
3. Bacteriology - none. (No mention of x-ray).

Material

648 cases of pneumonia (birth to 12 years) in one ward of children's hospital (January 1921 to October 1928) and 244 autopsies in the same disease. (83 from above series and 161 from other wards from July 1, 1922 to October 31, 1928). All of the (648 clinical cases) have been under one medical charge (C. McN.). All autopsies by (A. R. M.).

Definition

1. Alveolar (lobar) pneumonia: Differential diagnosis from bronchopneumonia can be made with certainty only at autopsy. Text book clinical standards fail in many cases because adult and childhood types are not the same. Use adult description of lobes for lobar pneumonia in childhood. Consolidation in children is seldom completely lobar. While lobar is a poor term, the histological change corresponds to the adult form, e.g. exudate in alveoli. There is very little involvement of the interstitial tissue and bronchitis is minimal or absent.

2. Bronchopneumonia: Severe bronchitis with inflammatory infiltration of the bronchial wall and interstitial framework and patchy consolidation following distribution of bronchial tree with or without confluence over areas of considerable size. The term 'bronchopneumonia' is therefore correct.

Clinical differences between alveolar and bronchopneumonia may be made. Physical signs elicited by auscultation and percussion are essential in diagnosis of consolidation and no diagnosis of clinical pneumonia was made without consolidation. Dry consolidation in one lobe (alveolar pneumonia) may be present. In addition scattered patches of consolidation over both lower lobes with rales are usually seen in bronchopneumonia. Small consolidations of the alveolar type may occur with catarrh of the bronchi or confluent patches of bronchopneumonia may simulate the consolidation of alveolar pneumonia.

Conclusion: Physical signs are of little service in making the differential diagnosis and may lead to error. The onset may be sudden in both although as a general rule, it is more abrupt in the alveolar type. Dyspnea and cyanosis may also be misleading. The most important clinical features are as follows:

Alveolar Pneumonia

- a. Cough - Absent, never prominent, or restrained by pleural pains
- b. Duration of high fever - not as a rule over two weeks. The fever is high but not always sustained.
- c. Decline of fever - crisis or occasionally by lysis and is followed in most cases by equally dramatic improvement in general condition and rapid resolution of the exudate.

Bronchopneumonia

- a. Cough - generally prominent. Occurs in bouts and paroxysms and is harsh and loud.
- b. Duration of high fever - In all severe cases it extends over several and perhaps many weeks. Throughout the temperature is apt to be irregular and remittent, although the early stages of rapidly confluent pneumonia may be high and sustained.
- c. Type of fever decline - In later stages of severe cases it drops gradually and irregularly to normal fever, about which it may fluctuate for some time. It seldom terminates by crisis and only rarely by regular lysis.

These three features; 1. the type of decline of fever, 2. character of the cough; 3. duration of the fever in this order of importance have been the principal criteria by which in doubtful cases, the type of pneumonia has been determined.

3. Bronchitis - cough, absence of physical signs of consolidation, rales and short fever. Group fades into bronchopneumonia and may be called this disease by some.

4. Slowly resolving pneumonia may last 2 months to one year or longer. Classified with alveolar group because of onset and early course, showing a definite and sometimes massive consolidation confined to one lobe or lung but with little or no cough. In latter stages course was almost afebrile with satisfactory general condition. The death rate was trifling. Nevertheless it seems likely that the interstitial framework has become the seat of a degree of chronic inflammation.

5. Empyema - Any collection of pus or sero-purulent fluid, even a small amount, free in the pleural cavity before or after death.

6. Pleurisy - Fibrinous pleurisy without evidence of pneumonia. In several of these pneumonia was suspected but no evidence was obtained clinically or postmortem. Very small group.

7. Miscellaneous group - Fatal cases. Various small groups. Terminal pneumonia, early fatal pneumonia and other indefinite cases.

Classification (Clinical series) Birth to 12 years.

Type	Cases	Deaths	Rate
Alveolar	386	26	6.5%
Bronchopneumonia	144	78	54.0%
Empyema	89	36	40.5%
Miscellaneous	21	21	100.0%
Acute pleurisy	8	2	25.0%
Total	648	163	25.0%

Classification (Post-mortem series) Birth to 12 years.

Bronchopneumonia	140	Chronic pneumonia	5
Alveolar pneumonia	23	Septic pneumonia (pyemia)	4
Terminal pneumonia	29	Unclassified	17
Miscellaneous pneumonia	15	Empyema without pneumonia	11
		Total	244

Comments: Clinically alveolar pneumonia is more common than broncho (59.5% to 22.2%). In clinical series the ratio of deaths is (6.5% to 54%). In postmortem series the ratio is (9.4% to 57.4%), indicating good sampling. Bronchopneumonia is more deadly; alveolar pneumonia is more common in childhood.

Factors in Mortality

1. Age - Clinical Series.

	Pneumonia			Bronchitis		
	Cases	Deaths	Rate	Cases	Deaths	Rates
Birth-6 months	45	40	89%	-	-	-
6-12 months	89	39	45%	-	-	-
12-18 months	91	34	37.5%	-	-	-
18-24 months	85	23	27%	-	-	-
Birth-2 years	310	136	44%	155	5	3%
2-5 years	184	18	10%	55	1	2%
5-12 years	154	9	6%	21	0	0%
Birth-12 years	648	163	25%	231	6	2.5%

1. Age Group - Post-mortem Series

	Deaths	Rate
Birth-2 years	196	80.5%
2-5 years	36	15.0%
5-12 years	11	4.5%
Birth-12 years	243	100.0%

3. Age Group - Alveolar Pneumonia

Birth-2 years	143	21	14.5%
2-5 years	131	2	1.5%
5-12 years	112	3	2.5%
Birth-12 years	386	26	6.5%
Post-mortem series	-	-	9.4%

Bronchopneumonia

	110	67	61%
	31	8	6%
	3	3	100%
	144	78	54%
Post-mortem series	-	-	57.3%

4. Sex - Clinical Series

	M.	F.		M.	F.
Bronchitis	126	105	Empyema	53	36
Alveolar pneumonia	230	156	Pleurisy	6	2
Bronchopneumonia	79	65	Bronchiectasis	11	22
Miscellaneous group	15	6	Totals	520	392

Males predominate in all except bronchiectasis.

5. Sex - Post-mortem Series

	M.	F.		M.	F.
Alveolar pneumonia	17	6	Chronic pneumonia	2	3
Bronchopneumonia	78	62	Septic pneumonia	3	1
Terminal pneumonia	21	8	Unclassified pneumonia	10	7
Miscellaneous Group	11	4	Empyema (no pneumonia)	7	4
				149	95

Males predominate.

Seasonal Incidence There was no significant difference in incidence of pneumonia during the entire 8 years. It was always a factor in morbidity and mortality during the entire time. By quarters pneumonia is highest in the fall quarter (Oct. - Dec.), slightly less in (January - March); lowest in (July to September). In both clinical and postmortem series this held. Bronchitis was higher in winter quarter.

Conclusions:

1. Alveolar pneumonia is more common than bronchopneumonia.*
2. Bronchopneumonia is more deadly than alveolar pneumonia.
3. The highest mortality occurs (first 2 years of life).
4. The highest mortality in the first 2 years of life is first 6 months.
5. Males predominate.
6. Pneumonia most common in fall quarter; next, winter quarter. Always a factor.
7. Dunlap (1908) collected 500 cases same hospital. Found 104 deaths, rate 21%. At same time hospital had 3,300 admissions. Present series 1928 (559 cases, 127 deaths, rate 22.5% out of 2,876 admissions and 549 total deaths).

* Difference may be due to climate differences or type of case but real difference is probably due to standards.

9. Bronchitis, pneumonia and bronchiectasis (912 cases - 169 deaths - 18.5%). All other cases (1,964, 380 deaths, 19.5%). While all other diseases admitted to hospital collectively were slightly larger, (1%) pneumonia, considered separately has a death rate somewhat higher in the other groups.

2. Empyema in Childhood

1. McNeill, MacGregor, A. R. & Alexander, W. A. : Arch. Dis. Childhood. 4:12-32: (Feb.) 1929.
2. Abt's Pediatrics. IV. W. B. Saunders. 1925.
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5. Foster, L.: Ann. Surg. XCII; 212: (August) 1930.
6. Suermondt, W. F.: Deutsche Ztschr. f. Chir. (Leipsic) 136:1-19:1924.
7. Hill, L. W.: Boston M. & S. J. 196:107: (Jan.) 1927.
8. Ladd, W. E. & Cutler, G. D.: S. G. O. 39:429-431: (Oct.) 1924.
9. Hudson, H. W.: New England, M. J. 202:853-859: (May) 1930

Incidence:

1. Total - 65,315 medical and surgical patients 0.5% were acute empyema (all ages) (Ref. 3)
2. Pneumonia in Childhood
89 out of 648 cases of (Ref. 1)

<u>Clinical Series</u>	<u>Pneumonia</u>	<u>Empyema</u>	<u>Rate</u>
Birth - 2 years	310	36	11.5%
2 - 5 "	184	19	10.5%
5 - 12 "	154	34	22.0%
Birth - 12 years	648	89	13.5%

Hill (Ref. 7) 2,000 cases of pneumonia in children. Empyema in 4 - 5%.

3. In Effusions

Gee. 169 cases pleurisy with effusion under 10 St. Bartholomew's Hospital; 84 purulent, 84 non-purulent. Carpenter: 116 cases under 5, 77 or 66% were purulent (Ref.2).

4. Etiology

256 cases of empyema occurred as complication of previous infection of lung and pleura (83%) out of 299 cases. 198 or 66% followed lobar or broncho-pneumonia. (Ref. 3)

Age Factor (Mortality Rate)

	Ref. 4	Ref. 3	Ref. 5	Ref. 8
0-1	36.3%	47.7%	(B-2)	(B-2)
1-2	35.2%	32.8%	21.7%	35.4%
2-3	16.6%	41.3%		
3-4	24.5%	0.0		
4-5	2.0%	15.4%		
5-6	16.0%			
6-7	2.5%			
7-8	7.1%			
8-9	-	(5-10)		
9-10	-	3.4%		
10-11			(2-12)	
11-12	14.2%		5.7%	
13-13	-			
Cases	427	200	92	48

Other:

185 children (under 12) 15.8%; 103 patients over 12 (7.7%) (Ref. 6)
 10-20 (26 cases) 15.3%; 20-30 (34 cases) 20.6%; 30-40 (16 cases) 31.2%;
 40-50 (11 cases) 36.3%; 50-60 (9 cases) 55.5% (Ref. 3). 12-40 (47 cases)
 12.7%; Over 40 (14 cases) 14.2% (Ref. 5).

Sex Factor - Males 59%; Females 41% (Ref. 3). Males 59%, females 41% (Ref. 4).
 Males 59%, females 41%, (Ref. 1.)

Organism Factor: (Mortality)

Ref. 5 (Foster)

	Cases	Deaths	Rate
Pneumococcus Type I	36	2	5.5%
" " II	5	2	40.0%
" " III	7	0	0.0%
" " IV	15	2	13.3%
" " Untd.	15	2	13.3%
Streptococcus Hemolyticus	25	3	12.0%
" Non- "	12	0	0.0%
Staphylococcus aureus	9	2	22.2%
" albus	0	0	0.0%
Unknown or mixed	29	4	13.7%
Total	123	17	11.1%

Ref. 7 (Hill)

	Case	Death	Rate	<u>Ref. 2 (Abt)</u>		
Pneumococcus	52	6	11.5%	77	43	56.0%
Streptococcus	16	3	18.7%	24	19	79. %
Staphylococcus	6	1	16.6%	12	6	50. %
Mixed infection	5	1	20.0%	39	19	62. %

Ref. 8 - 160 cases with pneumococcus empyema 15.6%.
 35 cases with streptococcic 28.5%.

Treatment Factor - Children (Mortality) Ref. 8.

<u>Author</u>	<u>Cases</u>	<u>Method</u>	<u>Mortality</u>
Alexander and Sherk	291	Open	B-1 (56%) 1-2 (24%) 2-3 (17%) 4-Up (11%)
Binney	(-10) 35	Closed then rib resection	14.3%
Bohrer	154	Open and closed	16.8%
Graham	90	Open	Under 2 - 39. % 12. %
Grant	171	Open	21. %
Grant	54	Closed	40. %
Ladd and Cutler (-2)	48	Open and closed	35.4%
(2-12)	220	Open and closed	13.5%
McEnerey and Brenne- mann	32	Aspiration	6. %
Hudson (Ref. 8)	32	Intercostal drainage	18.7%
	54	Rib resection	9.2%
	14	Drainage and resection	0.0%
Surmond (Ref.6) (-12)	185	Open and closed	15.8%

Conclusions

1. Empyema is a complication of pneumonia in childhood in from 4 to 13.5% of the cases.
2. More than half of all pleural effusions are purulent.
3. Pulmonary infections are the most frequent cause of empyema.
4. Disease occurs most frequently under 4 years.
5. Highest incidence is reported by many in the second and third years; highest mortality - 1st year.
6. Males predominate (59-41).
7. 580 collected cases (this series) showed pneumococcus 63%; streptococcus 20%; mixed infection 12%; staphylococcus 5%.
8. Mortality by organism (this series) streptococcus 38%; staphylococcus 33%; mixed infection 32%; pneumococcus 22%.
9. Variable results in mortality table probably due to difference in definition of empyema, mixed clinical and clinico-postmortem series, time of operation, etc.
10. Most authors agree that best results are obtained from rib resection in meta-pneumonic cases about three weeks after onset of illness.
11. Poorest results in synpneumonic types, bilateral effusions, (3% of all cases), complicated cases (pericarditis, peritonitis, endocarditis), left sided effusions? (statistical), early open drainage, young children (first few years), metastatic lesions (pyemia), etc.
12. Reported mortality from various procedures is 0 to 56%.