Current Therapy in Pulmonary Tuberculosis*

A STUDY OF 10 CASES BY 100 PARTICIPATING PHYSICIANS
WITH ANALYSIS OF THEIR OPINIONS

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In May 1948 the Committee on Non-Surgical Treatment of the American College of Chest Physicians started a special study to determine the type of therapy being used at that time for cases of pulmonary tuberculosis commonly seen by physicians treating diseases of the chest. Ten representative cases were selected. They were ordinary forms of tuberculosis that might be seen any day in a physician’s office. They were of different races, sexes, age groups, and types of disease, with no unusual or bizarre complications. The patients had been known to us for a long time. We attempted to make the initial problem as simple as possible.

A brief case report with a reproduction of the chest x-ray film of each case was sent out with a questionnaire. Fifty-seven physicians, representing 32 states, cooperated. They were chosen as representative of the

* A report of the Committee on Non-Surgical Treatment of the American College of Chest Physicians, 1953.
This is a condensed report. A more detailed analysis may be obtained by writing to the Committee on Non-Surgical Treatment, American College of Chest Physicians.
top clinical thinking in their area. No physicians who were primarily pathologists, roentgenologists, public health officers or hospital administrators were involved. The report of this first survey was published in Diseases of the Chest, November-December, 1948.

In March 1953 the same 10 cases were again sent to 100 physicians, including 31 who took part in the first study. They were selected by our committee because of their wide experience and high qualifications to discuss the therapy now being used in their respective areas. The accompanying map shows the geographic distribution of these specialists.

The following questionnaire accompanied each case:

I. Would you use bed rest alone as therapy for this type of case?
   A. If so, 
   1. When? 
   3. Dosage schedule?
   4. How long?

II. Would you add drug therapy?
   A. If so, 
   1. When?
   2. What kind?
   3. How long would you expect to continue collapse?
   4. If a successful collapse, what would be your criteria for stopping it?

III. Would you use collapse therapy?
   A. If so, 
   1. What kind?
   2. When?
   3. How long would you expect to continue collapse?
   4. If a successful collapse, what would be your criteria for stopping it?

IV. Would you use surgery?
   A. If so, 
   1. What kind?
   2. When?
   3. How long would you continue complete bed rest following surgery?
   4. If a successful operation, what would be your criteria for discharging this patient from a sanatorium?

In general, complete bed rest has been interpreted in this survey as strict rest in bed with no bathroom privileges, although four participants said they allow bathroom privileges to patients on complete bed rest. Most of the answers have indicated "modified bed rest" when any time up has been allowed.

The dosages prescribed by those using drug therapy are discussed in Case 1. In the next nine cases we do not repeat drug dosages inasmuch as the same physicians gave practically the same dosages throughout the 10 cases, and approximately all would start chemotherapy immediately.

The periods of chemotherapy varied for the different patients as described in the summary discussion.

Case Histories and Discussions

Case 1: Mr. R. V. E. (Minimal right apical lesion.) This 18 year old white male was found to have a small lesion in his right upper lung field on routine chest x-ray film during a Navy induction examination. He feels well and has no symptom. Past and family history—non-contributory. No known exposure to tuberculosis.

Physical examination negative. Intradermal tuberculin positive to 0.01 OT. Gastric lavage with guinea pig inoculation showed, at autopsy, typical tuberculous lesions from which acid-fast bacilli were recovered.

Chest x-ray film shows a small mottled infiltration at periphery of the right lung field in the first anterior interspace.

Treatment

The chart for case 1 shows a percentage comparison of the treatment specifically prescribed in 1953 with that prescribed in 1948. The qualified and indefinite answers as to therapy could not be included in the charts.

Bed rest alone: Of the nine physicians favoring bed rest alone, eight
would employ complete rest for six months or less, and six would keep him in the sanatorium for six to 12 months.

Chemotherapy: Of the 87 designating drug therapy, 85 would start it immediately. The majority specified combined intermittent SM (streptomycin) and PAS (para-aminosalicylic acid), and prescribed treatment for periods ranging from three to 18 months, more preferring 12 months. The dosage used by the greatest number was 1.0 gm. SM twice weekly or every three days plus PAS 10 to 15 gm. daily. Eleven specifically prescribe combined SM, PAS and INH (isonicotinic acid hydrazide), with dosages of SM and PAS as above while the greatest number would use a daily dosage of INH ranging from 150 to 300 mg. Here the period of prescribed treatment ranged from two to 18 months, with the largest number prescribing six to eight months. There were 28 who prescribed SM and PAS or SM and 1NH or PAS and 1NH, 11 of whom did not give their first choice although 13 specified SM and INH and four PAS and INH. The preferred dosages of SM and PAS were the same as above, and again the greatest number gave a daily dosage of INH ranging from 150 to 300 mg. The periods of treatment ranged from three months to two years, with 13 designating six to eight months.

Chemotherapy alone with bed rest: Of the 69 prescribing chemotherapy alone with bed rest, 43 would keep the patient at complete rest for six months or less, and 13 would give only “modified bed rest.” Thirty-six would keep the patient in the sanatorium for from 10 to 18 months, while five would use no hospitalization.

Collapse therapy: The answers as to when collapse should be established and the length of time it should be continued were as follows:

<table>
<thead>
<tr>
<th>Pneumoperitoneum—6 (one without drugs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>To be established:</td>
</tr>
<tr>
<td>Immed. Within</td>
</tr>
<tr>
<td>1 mo. 2</td>
</tr>
</tbody>
</table>

CASE I

<table>
<thead>
<tr>
<th>BED REST ALONE CHEMOT. COLLAPSE SURGERY</th>
<th>1953</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 10 20 30 40 50 60 70 80 90 100</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BED REST ALONE CHEMOT. COLLAPSE SURGERY</th>
<th>1948</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 10 20 30 40 50 60 70 80 90 100</td>
<td></td>
</tr>
</tbody>
</table>

Case I: A minimal right apical lesion in an 18 year old boy.

Chart I: 1953—69 per cent (indicated by the white line) prescribed chemotherapy alone with bed rest.
1948—7 per cent prescribed chemotherapy alone with bed rest.
**Pneumothorax right—7 (2 without drugs)**

To be established:

<table>
<thead>
<tr>
<th>Time</th>
<th>Percents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immed.</td>
<td>2-3 mos.</td>
</tr>
<tr>
<td>Within</td>
<td>1 yr.</td>
</tr>
<tr>
<td>1 mo.</td>
<td>13-18 mos.</td>
</tr>
<tr>
<td>3 mos.</td>
<td>1</td>
</tr>
</tbody>
</table>

To be continued:

<table>
<thead>
<tr>
<th>Time</th>
<th>Percents</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 mos.</td>
<td>1</td>
</tr>
<tr>
<td>2 mos.</td>
<td>2</td>
</tr>
<tr>
<td>2-3 mos.</td>
<td>1</td>
</tr>
</tbody>
</table>

**Phrenic crush right—3 (2 without drugs)**

To be performed:

<table>
<thead>
<tr>
<th>Time</th>
<th>Percents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immed.</td>
<td>2-3 mos.</td>
</tr>
<tr>
<td>2 mos.</td>
<td>1</td>
</tr>
</tbody>
</table>

Of the 16 using collapse therapy, half envisaged complete bed rest for from one to three months, and a majority would keep the patient in the sanatorium for six months or less.

**Surgery:** The answers as to when surgery should be performed and the length of time of complete bed rest following surgery were as follows:

<table>
<thead>
<tr>
<th>Procedure</th>
<th>To be performed</th>
<th>To continue complete bed rest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resection—6</td>
<td>1-2 mos.</td>
<td>3-4 mos.</td>
</tr>
<tr>
<td></td>
<td>5-6 mos.</td>
<td>2 mos.</td>
</tr>
<tr>
<td></td>
<td>1 mos.</td>
<td>3 mos.</td>
</tr>
</tbody>
</table>

*Would wait until maximum improvement on drugs and bed rest had been reached.

Of the six preferring resection, four would keep the patient on complete bed rest for two to three months and two for seven to nine months, while half would expect to keep him in the sanatorium six months or less and the other half for seven to 18 months.

**Discussion**

In this 18 year old white male with a minimal right apical lesion, with no symptoms and positive gastric lavage, nine physicians (9 per cent) would use complete bed rest alone, as compared to 40 per cent in 1948. However, if chemotherapy is included the percentages are reversed—78 per cent now compared to 47 per cent in 1948. As a corollary to this, the use of collapse therapy has dropped from 44 per cent in 1948 to 16 per cent now (including phrenics 3 per cent), the loss being nearly entirely at the expense of pneumothorax. Among the relatively few physicians now using collapse, there has been an increase in the use of pneumoperitoneum from 0 to 6 per cent, and a tremendous drop in the use of pneumothorax from 32 per cent to 7 per cent, as compared to 1948. Resection is now used by 6 per cent, and a few phrenics are still done as a primary collapse procedure.

It would seem that those favoring bed rest alone do not consider this a serious type of lesion, as nearly all would expect good results in six months or less, and half would discharge the patient from the sanatorium in six to nine months. With chemotherapy, 5 per cent would not hospitalize the patient at all and 13 per cent would not give complete bed rest. It is interesting to note that of the 69 per cent giving chemotherapy-plus-bed rest a large majority would keep the patient on complete bed rest for six months or less, although a majority would continue the sanatorium stay for 10 to 18 months. On the other hand, where pneumoperitoneum or pneumothorax is used, the period of complete bed rest is expected to be shortened to one to three months by the majority, and the sanatorium stay shortened to six months or less in most instances (as compared with the large majority estimating a 10 to 18 month sanatorium stay with chemotherapy alone plus bed rest).

The use of antimicrobial therapy has been previously discussed and needs little additional comment, other than to point out that only 8 per cent stated that they would not use drugs in this type of case. SM plus PAS is the first choice in most instances and, although there is variation in the dosage schedules of all three drugs, there is reasonable agreement in a large majority. However, there is little or no agreement as to how long the drugs should be continued.

**Case 2:** Mrs. J. S. (Tuberculous pneumonia.) This 31 year old white married female developed acute upper respiratory infection in January, followed by productive cough and fever. She had an hemoptysis and then visited her physician. Past history revealed a negative chest x-ray film three years previously. Another film in May of the preceding year was said to show a "spot" on her lung. For the past three to four years, she had noted weakness and easy fatigability, which she attributed to excessive menstrual flow.
X-ray film shows a diffuse homogeneous density occupying the upper half of the right lung field, containing a cavity. Sputum was positive on smear for tubercle bacilli.

Treatment

The chart for case 2 shows the treatment prescribed in 1953 and in 1948.

Chemotherapy: All of the 100 panel members would use combined chemotherapy, 99 stating they would start it immediately. Forty-two prescribed SM and PAS; 30 SM, PAS and INH; while 28 would use a combination of SM and PAS or SM and INH (at least 14) or PAS and INH (at least 2).

Chemotherapy alone with bed rest: Of the 15 prescribing chemotherapy alone with bed rest (5 of whom would possibly add pneumoperitoneum or surgery later) nine would keep her at complete rest for 10 to 18 months, and two would give only "modified rest." Ten recommended sanatorium care for 19 to 24 months.

Collapse therapy: The answers as to when collapse should be established and the length of time it should be continued were as follows:

**Pneumoperitoneum—32 (3 with right phrenic crush)**

To be established:

<table>
<thead>
<tr>
<th></th>
<th>Immed.</th>
<th>Within</th>
<th>2-3</th>
<th>4-6</th>
<th>*</th>
<th>†</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 mo.</td>
<td>13</td>
<td></td>
<td>4</td>
<td>7</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>mos.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

* as soon as toxicity and pneumonic appearance cleared
† when temperature became normal on chemotherapy

To be continued:

<table>
<thead>
<tr>
<th></th>
<th>1 yr.</th>
<th>13-18 mos.</th>
<th>2 yrs.</th>
<th>3 yrs.</th>
<th>4 yrs.</th>
<th>5 yrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>1</td>
<td>6</td>
<td>4</td>
<td>10</td>
<td>7</td>
</tr>
</tbody>
</table>

S Bed rest alone
S Chemoth
S Collapse
S Surgery

Case 2: Far advanced, tuberculous pneumonia in a 31 year old white woman.

Chart II: 1953—15 per cent (indicated by the white line) prescribed chemotherapy alone with bed rest.

3 per cent added phrenic crush to pneumoperitoneum.

1948—23 per cent prescribed chemotherapy alone with bed rest.

2 per cent added phrenic crush to pneumothorax.
Pneumothorax right—8

To be established:           To be continued:
Immed. Within  *   ↑ 3 yrs. 4 yrs. Indef.
1 mo.  answer
2 3 1 2 6 1 1

*as soon as toxicity and pneumonic appearance cleared
†when temperature became normal on chemotherapy

Of the 40 using collapse therapy, 19 expected to keep her at complete rest for four to 12 months (10 designating four to six months), while a majority would expect a sanatorium stay of 18 months or less. One would use only “modified rest” and would not hospitalize her.

Surgery: The answers as to when surgery should be performed and the length of time of complete bed rest following were as follows:

Resection—49

To be performed:           To continue complete bed rest:
1-2 3-4 5-6 7-9 10-12 13-18 * ↑ Indef.
mos. mos. mos. mos. mos. mos. mos. answer
5 4 8 10 4 1 10 3 4

*when maximum improvement on drugs and bed rest has been reached
†when maximum improvement on pneumonic appearance cleared and drugs has been reached

Thoracoplasty—3

To be performed:           To continue complete bed rest:
1 mo. 5-6 3-4 5-6
mos. mos. mos. mos. answer
1 2

Of the 52 using surgery (12 with preparatory pneumoperitoneum), 38 envisaged complete bed rest for four to 12 months (12 for four to six months and 16 for 10-12 months), and two designated only “modified bed rest.” Thirty-seven expected to keep her in the sanatorium for 13 to 24 months.

Discussion

In this far advanced case of tuberculous pneumonia, in a 31 year old white female, no one would treat with bed rest alone, and there was 100 per cent agreement in the use of combined antimicrobial drug therapy. There was a much greater tendency to use all three drugs in this case and to give SM daily in the beginning, the majority using the drugs from 12 to 24 months.

The use of collapse therapy dropped from 58 per cent in 1948 to 40 per cent now, largely at the expense of pneumothorax (from 53 per cent down to 8 per cent), with a corresponding large increase in the use of pneumoperitoneum (from 5 to 32 per cent). Three years seems to be the recognized time for pneumothorax to be continued. There was much disagreement as to how long to continue pneumoperitoneum, the largest group favoring five years, but substantial numbers prescribed three and four years, and a few shorter periods.

There has been a definite increase in the use of resection (49 per cent), at the expense of thoracoplasty and collapse therapy. A substantial number would keep the patient at complete bed rest for only one to four months following resection, with few considering a longer time than six months.

With present day therapy there seems to be little change in the length of time thought necessary for complete bed rest as compared with 1948, but in both studies there is no essential agreement although the large majority would envisage 12 months or less. Seemingly with resection the sanatorium stay is increased as compared with the collapse therapy group.
Case 3: Mrs. Z. L. (Minimal, bilateral, with right pleural effusion.) This 42 year old white female, housewife and former nurse, noted the onset of easy fatigability and occasional pain in her right chest in May. These symptoms persisted and in September she began to have night pains. On October 11th she developed acute pain in her right chest, dyspnea, chills and fever to 104°F.

X-ray film revealed a homogeneous density in the right pleural cavity (pleural effusion) and infiltration at both apices—more marked on the right.

Her mother died of tuberculosis in 1920—co-resident. Clear yellow fluid was aspirated from the right pleural cavity. Guinea pig inoculation of this fluid was negative. Guinea pig inoculation of material obtained on gastric lavage was positive for tubercle bacilli.

Treatment

The chart for case 3 shows the treatment prescribed in 1953 and in 1948.

Chemotherapy: Ninety-eight would use combined drug therapy, 97 starting it immediately. Fifty prescribed SM and PAS; 15 SM, PAS and INH; and 33 a combination of SM and PAS or SM and INH (at least 14) or PAS and INH (at least two).

Chemotherapy alone with bed rest: Of the 74 prescribing chemotherapy alone with bed rest (five of whom would possibly add surgery later), 43 would keep her at complete rest for six months or less and 22 for 7 to 12 months. A large majority would recommend sanatorium care for 10 to 24 months.

Collapse therapy: The answers as to when collapse should be established and the length of time it should be continued were as follows:

Pneumoperitoneum—17
To be established: Immed. Within 2-3 4-6 1 yr. 2 yrs. 3 yrs. 4 yrs. Indef.
1 mo. mos. mos. 1 2 3 3

*after fluid clears with drugs and bed rest

Pneumothorax right—1
To be established: Within 1 mo. To be continued: 2 yrs.

CASE III

Bed rest alone
Chemotherapy
 Collapse
 Surgery

1953

Bed rest alone
Chemotherapy
 Collapse
 Surgery

1948

Case 3: Minimal pulmonary tuberculosis bilateral, productive, with pleural effusion on the right, in a 43 year old white female.

Chart III: 1953—74 per cent (indicated by the white line) prescribed chemotherapy alone with bed rest.
1948—14 per cent prescribed chemotherapy alone with bed rest.
Of the 18 using collapse, the greatest number expected to keep her at complete rest for six months or less, one designating only "modified rest," while a large majority envisaged a sanatorium stay of 12 months or less.

Surgery: The answers as to when surgery should be performed and the length of time of complete bed rest following surgery were as follows:

Lobectomy right—3

To be performed: To continue complete bed rest:
2 mos. 2 mos. 3-4 mos.
6-9 mos. 5-6 mos.

1 1 1
1 1

*after effusion and left side had cleared

Thoracoplasty right—3

To be performed: To continue complete bed rest:
7-9 mos. 1 mos. 3-4 mos. 1 mos.
* Indef. *Indef.

1 1 1
1 1 1

*after effusion and left side had cleared

Of the six using surgery, half would expect to keep her at complete rest for seven to nine months, while the other half expected complete rest of six months or less. Half expected a sanatorium stay of 13 to 18 months.

Discussion

Practically no one would treat this pleural effusion plus minimal bilateral lesions, in a 43 year old white female, by bed rest alone. This is in marked contrast to the practice of 37 per cent in 1948. However, approximately three-fourths would use bed rest plus chemotherapy. Ninety-eight per cent would use antimicrobial therapy combined with various other methods.

There has been a marked decrease in the use of collapse therapy since 1948, largely at the expense of pneumothorax, which has dropped in favor from 37 per cent in 1948 to only 1 per cent at present. Those who favor pneumoperitoneum and drugs envisage a substantial decrease both in the amount of complete bed rest necessary and length of sanatorium stay. Most of these favor continuing pneumoperitoneum for only three years or less, which is not in accord with the facts in the literature. Whether this is
due to the influence of added drug therapy is not clear, although only 25 per cent used streptomycin in 1948 as compared with the present 98 per cent using combined chemotherapy. Only a few think surgery of any kind necessary in this case.

Case 4: Mr. W. N. (Moderately advanced, unilateral, acute, no cavity.) This 63 year old white male noted a productive cough, hoarseness and general run-down feeling in May. He was seen by a physician in June with the above complaints plus pain in the region of the right kidney.

Physical examination revealed rales at the right apex and right base posteriorly. X-ray film shows an area of infiltration at the periphery of the right upper lung field, a wedgeshaped area of increased density at the right hilus and a small patchy infiltration at the right base. Sputum was positive for tubercle bacilli.

Urological study—negative right kidney. History of left nephrectomy for hydronephrosis 10 years ago. Otherwise, past and family history essentially negative.

Treatment

The chart for case 4 shows the treatment prescribed in 1953 and in 1948.

Chemotherapy: Of the 99 favoring chemotherapy, 98 would start it immediately. Fifty-three prescribed SM and PAS, one starting with SM alone; 17 SM, PAS and INH; and 29 a combination of SM and PAS or SM and INH (at least 12) or PAS and INH (at least five).

Chemotherapy alone with bed rest: Of the 61 prescribing chemotherapy alone with bed rest (nine of whom would possibly add pneumoperitoneum later, and four surgery), 24 would keep the patient at complete rest for six months or less, while nine designated only "modified rest," and 20 up to 12 months complete rest. The great majority would keep him in the sanatorium for at least one to two years: 20 for 10 to 12 months, 10 for 13 to 18 months, and 22 for 19 to 24 months.

Collapse therapy: The answers as to when collapse should be established and the length of time it should be continued were as follows:

<table>
<thead>
<tr>
<th>Pneumoperitoneum—28 (with right phrenic crush—5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>To be established:</td>
</tr>
<tr>
<td>Immed. Within 2-3 4-6 *</td>
</tr>
<tr>
<td>1 mo. mos. mos. 11 5 10 1 1</td>
</tr>
<tr>
<td>*after bronchoscopy to rule out tuberculous tracheobronchitis—</td>
</tr>
<tr>
<td>if present, delay pneumoperitoneum until cleared on drugs</td>
</tr>
<tr>
<td>To be continued:</td>
</tr>
<tr>
<td>1 yr. 13-18 2 yrs. 3 yrs. 4 yrs. 5 yrs. *</td>
</tr>
<tr>
<td>Indef. answer mos. 1 1 4 8 4 5 1 4</td>
</tr>
<tr>
<td>*until ready for right thoracoplasty</td>
</tr>
</tbody>
</table>

Pneumothorax right—1

| To be established: Immediately To be continued: 1 yr. |

Of the 30 using collapse therapy (one extrapleural pneumothorax), about a third envisaged a period of complete rest of six months or less, while a third designated seven to 12 months. Five recommended only "modified rest." The great majority favored a sanatorium stay of from one to two years, with one stating he would possibly keep him in the sanatorium for as long as four years.

Surgery: The answers as to when surgery should be performed and the length of time of complete bed rest following surgery were as follows:
To continue complete bed rest:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>3-4 mos.</th>
<th>5-6 mos.</th>
<th>Indef. mos.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bed rest</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

*when maximum improvement on drugs was reached
†to be determined by the surgeon

Pneumonectomy right—2

To be performed:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>3-4 mos.</th>
<th>5-6 mos.</th>
<th>Indef. mos.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bed rest</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

*when maximum improvement on drugs was reached

Thoracoplasty right—2

To be performed:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>3-4 mos.</th>
<th>5-6 mos.</th>
<th>Indef. mos.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bed rest</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Of the nine using surgery (one exploratory thoracotomy), five expected to keep him at complete rest for 10 to 12 months, and six recommended sanatorium care over a year, with two for possibly as long as two years.

Discussion

This case of moderately advanced unilateral pulmonary tuberculosis, in a 63 year old white male, follows the same pattern of treatment as outlined for the other patients thus far studied. In comparison with 1948 there is a marked decrease in those who would use bed rest alone, but a definite increase in those who would use bed rest plus chemotherapy. There is a moderate decrease in those who would add collapse therapy, but an increase in the use of pneumoperitoneum, with pneumothorax dropping from 28 per cent to 2 per cent (only two physicians using it now). Under present day therapy there is a tendency for an increase in the length of time of complete bed rest and probably of sanatorium stay. Six per cent of the panel would do resection (two pneumonectomy) for this scattered lesion in a 63 year old man, and thoracoplasty is favored by two.

CASE V

Case 5: Moderately advanced pulmonary tuberculosis, unilateral, no cavity, fibrotic, in a 48 year old white male.

Chart V: 1953—43 per cent (indicated by the white line) prescribed chemotherapy alone with bed rest.

1948—5 per cent prescribed chemotherapy alone with bed rest.

4 per cent added phrenic crush to pneumoperitoneum.
Case 5: Mr. L. T. (Moderately advanced, unilateral, fibrotic, no cavity.) This 48 year old white male, school principal, had intermittent chest pain on the left since June one year ago. The following April he developed considerable epigastric distress and lost 10 to 15 pounds over the next few months. In October x-ray film revealed diffuse fine mottling throughout the upper half of the right lung field. Tuberculin test was positive and sputum was positive for tubercle bacilli. Excellent general condition. No other symptoms but a mild morning, slightly productive, cough.

Treatment

The chart for case 5 shows the treatment prescribed in 1953 and in 1948.

Chemotherapy: Of the 96 using combined drug therapy, 93 would start it immediately, two after one month or more of bed rest, and one would not begin drugs until several weeks before lobectomy. Forty-six prescribed SM and PAS; 11 SM, PAS and INH; and 39 a combination of SM and PAS or SM and INH (at least 15) or PAS and INH (at least three).

Chemotherapy alone with bed rest: Of the 43 prescribing chemotherapy alone with bed rest (five of whom would possibly add pneumoperitoneum or pneumothorax later, one possibly a phrenic, and two possibly resection), 22 would keep him at complete rest for six months or less, and five indicated only "modified rest." However, 20 expected a sanatorium stay of 10 to 12 months, and 15 up to two years.

Collapse therapy: The answers as to when collapse should be established and the length of time it should be continued were as follows:

<table>
<thead>
<tr>
<th>Pneumoperitoneum—25</th>
<th>To be established:</th>
<th>To be continued:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Immed. Within 2-3</td>
<td>9-12 2 yrs. 3 yrs. 4 yrs. 5 yrs.</td>
</tr>
<tr>
<td></td>
<td>1 mo. mos.</td>
<td>1 4 10 2 1 1</td>
</tr>
<tr>
<td></td>
<td>18 6 1</td>
<td>6</td>
</tr>
</tbody>
</table>

*until ready for thoracoplasty

<table>
<thead>
<tr>
<th>Pneumothorax right—12</th>
<th>To be established:</th>
<th>To be continued:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Immed. Within 2-3</td>
<td>3 yrs. 5 yrs.</td>
</tr>
<tr>
<td></td>
<td>1 mo. mos.</td>
<td>6 5 1</td>
</tr>
<tr>
<td></td>
<td>6 5 1</td>
<td>1 1</td>
</tr>
</tbody>
</table>

Of the 37 using collapse therapy, 26 would keep him at complete rest for six months or less. The expected sanatorium stay was extremely varied, ranging from one to 24 months. However, 26 envisaged 12 months or less.

Surgery: The answers as to when surgery should be performed and the length of time of complete bed rest following surgery were as follows:

<table>
<thead>
<tr>
<th>Resection—16</th>
<th>To be performed:</th>
<th>To continue complete bed rest:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Immed. 1-2 3-4 5-6 *</td>
<td>&quot;Modified&quot; 1-2 3-4 5-6 10-12</td>
</tr>
<tr>
<td></td>
<td>1 2 3 4 5 1 1</td>
<td>Indef.</td>
</tr>
</tbody>
</table>

*when maximum improvement reached on drugs and bed rest
†when lesion stabilized by pneumoperitoneum and drugs

<table>
<thead>
<tr>
<th>Re opened complete bed rest:</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Modified&quot; 1-2 3-4 5-6 10-12</td>
</tr>
<tr>
<td>Indef.</td>
</tr>
<tr>
<td>1 4 4 6 1</td>
</tr>
</tbody>
</table>

Downloaded From: http://journal.publications.chestnet.org/pdaccess.ashx?url=/data/journals/chest/21258/ on 06/26/2017
Thoracoplasty right—3

To be performed:

<table>
<thead>
<tr>
<th>Immed.</th>
<th>10-12 mos.</th>
<th>&quot;Modified&quot; 3-4 mos.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

†when lesion stabilized by pneumoperitoneum and drugs

Of the 19 using surgery, 11 expected to keep him at complete rest for six months or less, and two designated "modified rest." Nine would keep him in the sanatorium for 10 to 12 months, and five for 13 to 18 months.

Discussion

In this case of moderately advanced disease, unilateral, fibrotic, and without cavity, in a 48 year old white male, the same trends are noted as discussed for the previous cases. The most noteworthy is the marked drop, since 1948, in the use of collapse therapy—at the expense of pneumothorax with considerable increase in the use of pneumoperitoneum. Those who would use pneumothorax would continue the collapse for three years or longer, while, surprisingly, the majority of those who would use pneumoperitoneum would continue it for three years or less. Sixteen per cent would resect.

Case 6: Mrs. F. S. (Far advanced, bilateral cavitation, probable tuberculous tracheobronchitis.) This 29 year old white married female has been underweight and easily fatigued since childhood. Seven years ago she had an upper respiratory infection and lost weight from 95 to 75 pounds. She was fluoroscooped at that time and told that she had tuberculosis but after six weeks she returned to work—no treatment. In June and again in September preceding her present illness she had pleurisy on the left, and was treated with bed rest and sulfa drugs, only until the pain and fever subsided. Now in February a third attack of pleurisy brought her to another physician. Her tuberculin test, which was said to be negative several times before, was now positive.

X-ray film at this time shows several scattered hard densities in both upper lung fields. In addition, a soft mottled infiltration at the right apex with a 1 cm. cavity in the right second anterior interspace. There is a more diffuse mottled infiltration in the upper third of the left lung field with a 3 cm. cavity at the level of the left second anterior rib. Sputum was positive for tubercle bacilli.

Case 6: Far advanced pulmonary tuberculosis, bilateral cavities, acute, with probable tuberculous tracheobronchitis, in a 29 year old white female.

Chart VI: 1953—11 per cent (indicated by the white line) prescribed chemotherapy alone with bed rest.

- 4 per cent added phrenic crush to pneumoperitoneum.

1948—7 per cent prescribed chemotherapy alone with bed rest.

- 12 per cent added phrenic crush to pneumoperitoneum.
Treatment

The chart for case 6 shows the treatment prescribed in 1953 and in 1948.

Chemotherapy: All of the 99 favoring combined drug therapy would start it immediately. Forty-six prescribed SM and PAS; 26 SM, PAS and INH; and 27 a combination of SM and PAS or SM and INH (at least 14) or PAS and INH (at least three).

Chemotherapy alone with bed rest: The 11 prescribing chemotherapy alone with bed rest (six of whom would possibly add surgery later) varied considerably as to the time they would expect to keep her at complete bed rest, ranging from one to 18 months. Five would keep her in the sanatorium for 19 to 24 months, three for 13-18 months, and one for possibly as long as three years.

Collapse therapy: The answers as to when collapse should be established and the length of time it should be continued were as follows:

Pneumoperitoneum—78 (with left phrenic crush—4)

*when there is a negative bronchoscopy and no evidence of blocked cavity

Pneumothorax—4 (2 left, and 2 right with left thoracoplasty)

Extrapleural pneumothorax left—1

Of the 83 using collapse therapy, 36 would expect to keep her at complete bed rest for 10 to 12 months, while 22 envisaged one to nine months and few for over 18 months. Fifty-five would expect to keep her in the sanatorium for over a year: 14 for 13 to 18 months, 29 for 19 to 24 months, 10 for 30-36 months, and two for possibly as long as four years.

Surgery: The answers as to when surgery should be performed and the length of time of complete bed rest following surgery were as follows:

Bilateral segmental or wedge resection—4 (with preparatory pnp.—3)

Lobectomy left—2

To be performed: To continue complete bed rest:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>1</th>
<th>2</th>
<th>1</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>3-6</th>
<th>12 mos.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3-4</td>
<td>mos.</td>
</tr>
</tbody>
</table>

To be performed: To continue complete bed rest:

<table>
<thead>
<tr>
<th></th>
<th>3-6</th>
<th>12 mos.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3-4</td>
<td>mos.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>1</th>
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<tr>
<td></td>
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<td></td>
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</tbody>
</table>

Downloaded From: http://journal.publications.chestnet.org/pdfaccess.ashx?url=/data/journals/chest/21258/ on 06/26/2017
Thoracoplasty left—6 (with preparatory pneumoperitoneum—2) (with pneumothorax right—2)

To be performed:  To continue complete bed rest:

<table>
<thead>
<tr>
<th></th>
<th>3-4</th>
<th>7-9</th>
<th>18 mos.</th>
<th>*</th>
<th>3-4</th>
<th>5-6</th>
<th>Indef.</th>
</tr>
</thead>
<tbody>
<tr>
<td>mos.</td>
<td>mos.</td>
<td>mos.</td>
<td>answer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

*after right cavity closed

Bilateral extraperiosteal lucite plombage—1

To be performed:  To continue complete bed rest:

<table>
<thead>
<tr>
<th></th>
<th>1-3 mos. after starting drugs</th>
<th>6-12 mos.</th>
</tr>
</thead>
</table>

Of the 13 favoring surgery, seven would expect to keep her at complete bed rest for 12 months or longer, and one recommended only "modified rest." A majority would keep her in the sanatorium for from one and one half to three years.

Discussion

Trends are the same in this far advanced case with bilateral cavitation, in a 29 year old white female. There are many more who would continue drugs for from 13 months to three years. About the same percentage would use collapse therapy as in 1948 (83 and 89 per cent), but pneumothorax collapse has dropped from 46 to 5 per cent, and pneumoperitoneum has gained from 43 to 78 per cent. A little more than a third would continue pneumoperitoneum for from four to six years; in year groups the largest number (22) being in the 3 year and 16 would continue it for only one to two years. There is a great difference of opinion on this point. Six would envisage resection (four bilateral), and six thoracoplasty on the left.

There is tremendous variation in the amount of complete bed rest which was thought necessary in this case, apparently about the same as in 1948. The length of sanatorium care was over 19 months in the majority of instances, some continuing it as long as four years.

Case 7: Mrs. E. B. (Far advanced, bilateral, with left cavity.) This 28 year old colored married female had frequent "colds" and an almost continuous productive cough since an attack of pneumonia in September, 18 months ago. She had casual contact with a sister who died of tuberculosis in 1942. On February sixth an x-ray film revealed mottled infiltration of miliary type throughout the entire right lung and a 4 cm. hilar cavity with an area of infiltration extending along the border of the cardiac shadow toward the base on the left. Sputum was positive for tubercle bacilli.

Case 7

Case 7: Far advanced, bilateral pulmonary tuberculosis, with mottling throughout right and large cavity in the left hilum, in a Negro female, age 28.

Chart VII: 1953—17 per cent (indicated by the white line) prescribed chemotherapy alone with bed rest.

1948—8 per cent added phrenic crush to pneumoperitoneum.

1948—14 per cent prescribed chemotherapy alone with bed rest.

82 per cent added phrenic crush to pneumoperitoneum and 2 per cent to pneumothorax.
Treatment

The chart for case 7 shows the treatment prescribed in 1953 and in 1948.

Chemotherapy: All of the 100 panel members would use drug therapy in this case and all would start it immediately. Forty-three prescribed SM and PAS; 34 SM, PAS and INH; and 23 SM and PAS or SM and INH (at least 12) or PAS and INH.

Chemotherapy alone with bed rest: Of the 17 prescribing chemotherapy alone with bed rest (10 of whom would possibly add surgery later), eight would expect to keep this patient at complete bed rest for 10 to 12 months. Two recommended only "modified rest," and four gave indefinite answers. All would keep her in the sanatorium for a year or longer, six envisaging 19 to 24 months and five anticipating 30 to 36 months.

Collapse therapy: The answers as to when collapse should be established and the length of time it should be continued were as follows:

Pneumoperitoneum—67 (with bronchoscopy first—3)
(with left phrenic crush—7)
(with right phrenic crush—1)

To be established:
Immed. Within 2-3 1 mo. mos. mos. mos. mos.
12 11 5 1 1

*following bronchial lavage
†following lobectomy left

To be continued:
1 yr. 2 yrs. 3 yrs. 4 yrs. 5 yrs. * Indef.
mos. mos. mos. mos. mos.
4 1 6 16 11 12 6 11

*until ready for resection

Pneumothorax left—2
To be established: To be continued:
Immed. 3 mos. 3-4 yrs. 3-5 yrs.
1 1

Extrapleural pneumothorax left—1
To be established: Immediately To be continued: Indef. answer

Twelve of the 70 using collapse therapy added surgery. Among the other 58 the amount of expected complete bed rest varied greatly, the majority falling between one and 12 months, with 18 envisaging six months or less. The greatest number anticipated a sanatorium stay of 19 to 24 months or longer, seven designating 30 to 36 months and one four years.

Surgery: The answers as to when surgery should be performed and the length of time of complete bed rest following surgery were as follows:

Resection left—25 (with bronchoscopy first—1)
(with preparatory pneumoperitoneum—6)
(with pneumoperitoneum continued—2)
(followed by pneumoperitoneum—1)

To be performed:
1-2 5-6 10-12 13-18 * Indef.
mos. mos. mos. mos. mos.
1 1 1 1 16 3

*as soon as condition of the right lung would permit
To continue complete bed rest:

"Modified" 3-4 5-6 7-9 10-12 6-24 Indef.
mos. mos. mos. mos. mos. answer
2 2 12 1 3 1 4

Of the 25 using surgery, half would expect to keep her at complete bed rest for 10 to 12 months, with seven anticipating a longer period and three designating only "modified rest." Thirteen envisaged a sanatorium stay of 19 to 24 months and one for as long as 30 to 36 months.

Discussion

In this acute far advanced bilateral disease, in a 28 year old colored female, again all would use intermittent combined antimicrobial therapy, and most would add collapse therapy. The same marked trend toward pneumoperitoneum is apparent, pneumothorax being favored in only three instances (one extrapleural). There has been a decided decrease in the use of phrenic nerve operations since 1948. A large majority would continue pneumoperitoneum for three to five years. Again there is the marked increase in the use of resection from 3 per cent in 1948 to 25 per cent now. The greatest number would keep her at complete bed rest following surgery for six months or less. The over-all picture does not suggest that the period of bed rest or sanatorium stay has been shortened by recent developments in treatment—in fact, the reverse is suggested.

Case 8: Mr. I. A. (Moderately advanced, solitary 3 cm. cavity right apex.) This 34 year old male, shipyard worker, had occasional bilateral chest pains for four years when, following an appendectomy in January, he developed an ischiorectal abscess. On July 31st, he was rejected by the Army because of a "tuberculous cavity" in the right upper lung. On August 18th, he had a small hemoptysis followed by fever for several days. He visited a physician, and physical examination plus x-ray film revealed only a 3 cm. cavity at the right apex. Sputum was positive for tubercle bacilli.

Treatment

The chart for case 8 shows the treatment prescribed in 1953 and in 1948.

Chemotherapy: Of the 96 prescribing combined drug therapy, 95 would start it immediately. Fifty prescribed SM and PAS; 15 SM, PAS and
INH; and 31 SM and PAS or SM and INH (at least 13) or PAS and INH (at least four).

**Chemotherapy alone with bed rest**: Of the 10 prescribing chemotherapy alone with bed rest (nine of whom would possibly add surgery later), six would expect to keep him at complete bed rest for seven to nine months, while two designated only "modified rest." All but one anticipated a sanatorium stay of a year or longer, four designating 13 to 18 months, and two indicating 19 to 24 months.

**Collapse therapy**: The answers as to when collapse should be established and the length of time it should be continued were as follows:

**Pneumoperitoneum**—13 (with right phrenic crush—1)

<table>
<thead>
<tr>
<th>To be established</th>
<th>To be continued</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immed. 3 mos.</td>
<td>6 mos. 2 yrs.</td>
</tr>
<tr>
<td></td>
<td>3 yrs. 5 yrs.</td>
</tr>
<tr>
<td>* † Indef.</td>
<td>answer</td>
</tr>
<tr>
<td>12</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

*until ready for resection  †until ready for thoracoplasty

**Pneumothorax right**—18

<table>
<thead>
<tr>
<th>To be established</th>
<th></th>
<th>To be continued</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Immed. Within</td>
<td>2-3</td>
<td>6 mos. Indef.</td>
<td></td>
</tr>
<tr>
<td>1 mo. mos. answer</td>
<td>7  3</td>
<td>6  1  1</td>
<td></td>
</tr>
</tbody>
</table>

**Resection right**—52 (with preparatory pneumoperitoneum—2)

(with pneumoperitoneum before and after surgery—1)
(with corrective thoracoplasty—4)

<table>
<thead>
<tr>
<th>To be performed</th>
<th></th>
<th>To continue complete bed rest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immed. 1-2</td>
<td>3-4</td>
<td>5-6</td>
</tr>
<tr>
<td>mos. mos. mos. mos. mos. answer</td>
<td>5</td>
<td>9</td>
</tr>
</tbody>
</table>

*after maximum drug response or when lesion has stabilized

**Thoracoplasty right**—11 (with preparatory pneumoperitoneum—2)

(possibly with resection later—1)

<table>
<thead>
<tr>
<th>To be performed</th>
<th>To continue complete bed rest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immed. 1-2</td>
<td>3-4</td>
</tr>
<tr>
<td>mos. mos. mos. mos. answer</td>
<td>3</td>
</tr>
</tbody>
</table>

*as soon as general condition warrants
Of the 63 advising surgery, 32 would expect to keep him at complete bed rest for six months or less (21 designating four to six months) and six designated only “modified rest.” The expected sanatorium stay ranged from one to three months to 24 to 36 months, with 27 anticipating 10 to 12 months and 15 indicating 13 to 18 months.

Discussion

In this case of moderately advanced disease with a unilateral cavity, in a 34 year old white male, nearly all would use chemotherapy. Again, there has been a definite reduction in the use of collapse therapy, from 68 per cent in 1948 to 31 per cent now. Although there has been a marked drop in the use of pneumothorax in favor of pneumoperitoneum since 1948, it is interesting to note that still 18 per cent would try right pneumothorax and continue it for three to five years in most instances. Surgery was the treatment of choice for this type of case, that is, 64 per cent of the total answers, with only 8 per cent not considering it. Fifty-two favored resection, 11 thoracoplasty, and the large majority would operate within the first six months.

Case 9: Mrs. C. W. (Moderately advanced, bilateral, acute.) This 34 year old white married female felt well until she developed pain beneath the left scapula. She visited her physician at once, who found her intradermal tuberculin to be positive to 0.01 mg. OT. X-ray film revealed a soft mottled infiltration in both upper lung fields, more extensive on the left. Sputum was positive for tubercle bacilli.

Treatment

The chart for case 9 shows the treatment prescribed in 1953 and in 1948.

Chemotherapy: Of the 99 panel members favoring combined drug therapy, 98 would start it immediately. Forty-seven prescribed SM and PAS; 16 SM, PAS and INH; and 36 SM and PAS or SM and INH (at least 14) or PAS and INH (at least four).

Chemotherapy alone with bed rest: Of the 37 prescribing chemotherapy alone with bed rest (seven of whom would possibly add pneumoperi-
toneum later and four possibly surgery), about half would expect to keep her at complete bed rest for six months or less (13 designating four to six months) and seven designated only “modified rest.” Twelve would expect to keep this patient in the sanatorium for 10 to 12 months, eight for 13 to 18 months, and eight for 19 to 24 months, with one possibly for as long as three years.

Collapse therapy: The answers as to when collapse should be established and the length of time it should be continued were as follows:

Pneumoperitoneum—57

To be established:  
Immed. Within 2-3 4-6 *
1 mo. mos. mos. mos.
34 9 4 7 3

*after bronchoscopy if findings were negative

To be continued:
1 yr. 13-18 2 yrs. 3 yrs. 4 yrs. 5 yrs. * Indef. answer
1 1 7 26 10 5 1 6

*until ready for resection

Pneumothorax left—2

To be established:  
Within 2 mos.
1 1
1 mo.
1

To be continued:
1-2 2-3
1 yrs. yrs.
1

Of the 59 using collapse therapy (one of whom added surgery later and four said they would consider surgery later), 28 would expect to keep her at complete bed rest for six months or less, 24 for seven to 12 months, and two designated only “modified rest.” Eighteen anticipated a sanatorium stay of 10 to 12 months, 21 for 13 to 18 months, seven for nine months or less, and six for 19 to 36 months, and six gave indefinite answers.

Surgery: The answers as to when surgery should be performed and the length of time of complete bed rest following surgery were as follows:

Resection—4 (3 probably bilateral)  
(with preparatory pneumoperitoneum—1)

To be performed:  
* Indef. answer
3 1

To continue complete bed rest:  
“Modified” 3-4 12 mos. Indef. answer
1 1 1 1

*when maximum benefit from drugs is obtained or when lesions are stable

Bilateral extraperitoneal lobe plombage—1

To be performed: 1-3 mos.  
To continue complete bed rest: 3-6 mos.

Of the five advising surgery, three would expect to keep the patient at complete bed rest for six months or less, while one anticipated 10 to 12 months. Four expected a sanatorium stay of 10 to 12 months, and one 13 to 18 months.

Discussion

No one at the present time would treat this moderately advanced acute bilateral disease, in a 34 year old white female, with bed rest alone, as compared to 28 per cent in 1948. However, 37 per cent would use only bed rest plus chemotherapy. There has been an increase since 1948 in the number who would use collapse therapy (from 46 to 59 per cent), with 57 per cent now favoring pneumoperitoneum. Pneumothorax
would be tried in only two instances, in contrast to 29 per cent in 1948. Only 4 per cent would consider resection as a primary procedure and extraperiosteal lucite plombage was suggested only once. Ninety-nine per cent would use chemotherapy.

Case 10: Mr. E. H. (Far advanced, bilateral fibrocaseous lesions, with cavity left.) This 57 year old white American is a sales manager. No family history of tuberculosis. No known contacts.

Past History: Pneumonia at the age of 14, and 21 years.

Present Illness: Two years ago he began to feel below par. Prostatitis was diagnosed and treated. Last year diagnosed "heart trouble." X-ray film finally taken, shows old calcified lesions at the right apex, multiple scattered nodules, little fibrosis, but soft infiltration throughout his right lung in the upper two-thirds. Left lung shows a soft mottling throughout the upper one-third with a 1.5 cm. cavity in the first interspace. Sputum was positive for tubercle bacilli. He was afebrile. Few chest symptoms. No other medical problem.

Treatment

The chart for case 10 shows the treatment prescribed in 1953 and in 1948.

Chemotherapy: Of the 99 panel members favoring combined drug therapy, 98 would start it immediately. Forty-six prescribed SM and PAS; 17 SM, PAS and INH; and 36 SM and PAS or SM and INH (at least 16) or PAS and INH (at least three).

Chemotherapy alone with bed rest: Of the 35 prescribing chemotherapy alone with bed rest (four of whom would possibly add pneumoperitoneum later and nine possibly surgery), 14 would expect to keep him at complete bed rest for 12 to 18 months, while seven anticipated six months or less, and eight designated only "modified rest." Two-thirds anticipated a sanatorium stay of over a year: six for 13 to 18 months, 13 for 19 to 24 months, and four for as long as 24 to 36 months.

Case 10: Far advanced pulmonary tuberculosis, fibrocaseous lesions in the upper half of both lungs with cavity left, in a 57 year old white male.

Chart X: 1953—35 per cent (indicated by the white line) prescribed chemotherapy alone with bed rest. 2 per cent added phrenic crush to pneumoperitoneum.

1948—23 per cent prescribed chemotherapy alone with bed rest. 4 per cent added phrenic crush to pneumoperitoneum and 2 per cent to pneumothorax.
**Collapse therapy:** The answers as to when collapse should be established and the length of time it should be continued were as follows:

<table>
<thead>
<tr>
<th>Pneumoperitoneum—57 (one without drugs)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>To be established:</strong></td>
<td></td>
</tr>
<tr>
<td>Immed.</td>
<td>Within</td>
</tr>
<tr>
<td>1 mo.</td>
<td>mos.</td>
</tr>
<tr>
<td>36</td>
<td>8</td>
</tr>
<tr>
<td>*after bronchoscopy</td>
<td></td>
</tr>
<tr>
<td><strong>To be continued:</strong></td>
<td></td>
</tr>
<tr>
<td>1 yr.</td>
<td>2 yrs.</td>
</tr>
<tr>
<td>3</td>
<td>7</td>
</tr>
</tbody>
</table>

*until ready for resection
†one might continue collapse for 6 years

<table>
<thead>
<tr>
<th>Pneumothorax left—3</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>To be established:</strong></td>
<td><strong>To be continued:</strong></td>
</tr>
<tr>
<td>Immed.</td>
<td>2 mos.</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

*if not satisfactory would abandon immed.

<table>
<thead>
<tr>
<th>Phreniceotomy left—1</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>To be performed:</strong></td>
<td>Immediately</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bilateral extrapleural pneumothorax—1</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>To be established:</strong></td>
<td>after 4 mos. drugs</td>
</tr>
</tbody>
</table>

Of the 62 using collapse therapy (one of whom did resection later and 14 would consider surgery later), 26 would expect to keep him at complete bed rest for six months or less (19 designating four to six months), while 23 anticipated up to 12 months, and four designated only “modified rest.” The greatest number anticipated a sanatorium stay of over a year: 16 for 13 to 18 months, 16 for 19 to 24 months, and six for 24 to 36 months.

**Surgery:** The answers as to when surgery should be performed and the length of time of complete bed rest following were as follows:

<table>
<thead>
<tr>
<th>Resection left—2 (with preparatory pneumoperitoneum—1)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>To be performed:</strong></td>
<td><strong>To continue complete bed rest:</strong></td>
</tr>
<tr>
<td>* Indef. answer</td>
<td>2 mos.</td>
</tr>
</tbody>
</table>

*when right side clears on drugs and bed rest

<table>
<thead>
<tr>
<th>Thoracoplasty left—1 (with paraffin pack on right)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>To be performed:</strong> 2 mos.</td>
<td><strong>To continue complete bed rest:</strong> Indef. answer</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bilateral extrapleuralduced plombage—1</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>To be performed:</strong> 1-3 mos.</td>
<td><strong>To continue complete bed rest:</strong> 6-12 mos.</td>
</tr>
</tbody>
</table>

The period of complete bed rest expected by the four advising surgery ranged from four to six months to 10 to 12 months, with two anticipating a sanatorium stay of 13 to 18 months, one 10 to 12 months, and one gave an indefinite answer.

**Discussion**

In this case of far advanced pulmonary tuberculosis with cavitation and bilateral fibrocaseous disease, in a 57 year old white male, no one would now use bed rest alone, but 36 per cent would treat with bed rest and chemotherapy only. Again, practically everyone would use combined intermittent drug therapy, but 62 per cent would add collapse therapy, which is a marked increase over the practice in 1948, when only 21 per cent used chemotherapy plus collapse therapy. Again, by far the greatest number would use pneumoperitoneum, with only 3 per cent advocating pneumothorax.
DISCUSSION

Antimicrobial therapy is now generally accepted by the vast majority of chest physicians as part of the routine treatment of pulmonary tuberculosis, whatever the extent of the disease. Ninety-seven per cent used such therapy as part of the basic treatment, with variation according to the extent of the disease only from 93 per cent for minimal disease to 99.5 per cent for far advanced disease. The drugs of choice were limited to streptomycin (SM), para-aminosalicylic acid (PAS), and isonicotinic acid hydrazide (INH). Practically all used combined and continuous therapy, with a marked preference for SM plus PAS. A majority favored the intermittent use of SM in a dosage of 1.0 gm. twice weekly, with PAS by mouth to tolerance, about 12 gm. daily. There was less agreement about INH dosage, which varied from 3 mg./kg. of body weight to 10 mg./kg., with a majority using 3 to 5 mg./kg. In the more acute far advanced cases there was a definite trend toward combining all three drugs. The preceding data show a trend toward standardization in the use of antimicrobial therapy, but when the length of time such therapy should be continued is studied, no pattern evolves. There are recommendations for courses of from one month all the way to continuous therapy for three years. In minimal and moderately advanced disease a majority thought in terms of one year or less, with a considerable number less than eight months; while in far advanced disease a majority would continue the drugs for from one to two years. However, in both instances, there were many recommendations that these broad generalizations would not cover.

As a corollary to the above, there are now few who use bed rest alone in the treatment of pulmonary tuberculosis—only 1 per cent of the total reporting, and in only 5.5 per cent of 200 answers on the only group in which it is used to any extent, minimal disease.

However, 37 per cent of the group as a whole favored antimicrobial therapy plus bed rest as the treatment of choice. This percentage was made up largely from the answers on the treatment of minimal disease, in which nearly three-quarters of the group favored that therapy, and the remainder from two of the moderately advanced cases (cases 4 and 5). These were both unilateral cases without cavitation, one acute in a 63 year old white male and the other fibrotic in a 48 year old white male. One might hazard an opinion that it was the factor of the disease being unilateral without cavitation which influenced this decision. In the two minimal and two moderately advanced cases (4 and 5), no direct comparison can be made with the previous answers in 1948, except that the use of bed rest plus drugs and without collapse therapy has tremendously increased, at the expense of collapse therapy. In the remaining cases, with exception of case 2 (tuberculous pneumonia), the use of bed rest plus drugs without collapse and/or surgery has shown some increase.
Medical collapse therapy was advised, in addition to bed rest and drugs, as a primary procedure in 42 per cent of the total answers, varying from only 17 per cent in minimal disease to 57.5 per cent in far advanced. Of the 37.5 per cent who favored collapse in the four moderately advanced cases, the largest single number came from case 9, a bilateral acute disease in a 34 year old white female. Again in comparison with the answers in 1948, there has been a definite reduction of those who would use collapse therapy in the minimal cases and the moderately advanced case 4 in favor of chemotherapy plus bed rest, and in moderately advanced case 5 in favor of chemotherapy plus bed rest and resection. In addition, there has been a decrease in the use of collapse, largely in favor of resection, in case 8 (moderately advanced, unilateral solitary 3 cm. cavity) and in case 2 (tuberculous pneumonia). In comparison with the figures in 1948, the amount of collapse recommended in the other four cases (moderately advanced case 9 and far advanced cases 6, 7 and 10) has remained about the same or has increased. These are essentially the bilateral cases.

It is noteworthy that pneumothorax has decreased in use, from the collapse therapy of choice for the large majority in 1948 to only 6 per cent at present. The one case in which it was advised to any extent was case 8 (the isolated upper lobe 3 cm. cavity). On the other hand, pneumoperitoneum has increased from a small figure in 1948 to a present 35 per cent. Phrenics and extrapleural procedures were advised rarely in any of these commonly seen 10 cases.

When collapse was used, it was initiated from immediately to within three months by the great majority. In the few advising pneumothorax, there was considerable agreement that the collapse should be continued for at least three years. On the other hand, there was little agreement as to how long pneumoperitoneum should be continued, but more than half visualized a period of from one to three years only.

Excision surgery and thoracoplasty were under consideration as a primary procedure in 20 per cent of the total 1000 answers. This was largely made up of excision surgery, as thoracoplasty has fallen in favor to a low point indeed (3 per cent). The only case in which thoracoplasty was considered to any extent was case 8 (isolated upper lobe 3 cm. cavity) in which 11 per cent favored the procedure. The total of 17 per cent for excision surgery came largely from two cases: the moderately advanced case 8 and case 2 (tuberculous pneumonia), in which its use was suggested by 52 per cent and 49 per cent respectively. In only two other cases was even a moderate use of excision visualized as necessary. These were case 5 (moderately advanced unilateral disease without cavity, in a 48 year old white male) and case 7 (far advanced bilateral with mottling scattered throughout right and large cavity in left hilum, in a 28 year old Negro woman).

As brought out by the above, when one reads a current paper on the surgery of pulmonary tuberculosis or hears a surgeon speak on the subject, it is well to remember that he is still talking about a select and well-
screened group of patients. This is a point that the surgeon himself does not emphasize as a rule.

In the above cases of excision surgery, a majority would operate in four months or less in cases 5 and 8, in nine months or under in case 2 (tuberculous pneumonia), and when the right lung would allow in case 7. Following surgery, a large majority would keep the patient on bed rest for six months or less.

Again considering this group of 10 cases as a whole, the answers to the questions on the length of time of complete bed rest and sanatorium stay were extremely varied between cases, as would be expected, and even in each case itself. It does seem that more of the few who would add pneumoperitoneum to the treatment of minimal cases visualized a shorter period of sanatorium care than did those who used chemotherapy alone with bed rest. The same is true in some other cases, particularly the far advanced group and in moderately advanced case 5. However, except for minimal case 1, and those instances in minimal case 3 and moderately advanced case 5 where pneumoperitoneum was added to the treatment, a majority would keep the patient in the sanatorium for from 12 to 24 months. There is some suggestion that, under present day therapy, the length of sanatorium stay has lengthened since 1948.

*Treatment of choice for commonly seen types of pulmonary tuberculosis*: The treatment of choice for the various types of pulmonary tuberculosis seen in these 10 cases, in the opinion of a majority of the 100 consultants in their 1000 answers, is as follows:

**Antimicrobial therapy and bed rest**
- Minimal disease, Cases 1 and 3: 71% (12% added pnp.)
- Mod. adv. disease, unilat., without cavitation:
  - Case 4, acute: 61% (28% added pnp.)
  - Case 5, fibrotic: 43% (51% would use collapse or resection — pnp. 23%, pnx. 12%, resection 16%)
- Antimicrobial therapy and pneumoperitoneum:
  - Mod. adv. disease, acute, bilat., without cavitation: Case 9: 56% (37% used drug therapy alone with bed rest)
  - Far adv. disease, bilat., with cavitation:
    - Cases 6, 7, 10: 61% (in case 7, resection 25%; in case 10, drug therapy alone with bed rest 35%)
- Antimicrobial therapy and resection:
  - Mod. adv. disease, unilat., upper lobe 3 cm. cavity: Case 8: 52% (thoracoplasty 11%; pnx. 18%)
  - Tuberculous pneumonia
    - Case 2: 49% (pnp. 25%; drug therapy alone with bed rest 15%)

An earlier report concerned with this study conducted by this committee in 1948 has been translated into Japanese.

**SUMMARY**

A résumé and a 4 x 5 reduction of the chest roentgenogram of 10 cases of commonly seen types of pulmonary tuberculosis were sent to 100 chest physicians who were chosen by our committee as representative of the
top clinical thinking in their respective areas throughout the United States. Each consultant was asked to give his opinion as to treatment. A previous similar study was done in 1948, using the same 10 cases. In the present study the 1000 answers (10 each from 100 physicians) were analyzed and give a good cross-section of the current thinking on treating pulmonary tuberculosis.

**Summary Tabulation**

<table>
<thead>
<tr>
<th>Type of Therapy</th>
<th>Total 1000 answers</th>
<th>Minimal Cases 1 and 3</th>
<th>Mod. Ade. Cases 4, 5, 8, 9</th>
<th>Par Ade. Cases 2, 6, 7, 10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>Per Cent</td>
<td>No.</td>
<td>Per Cent</td>
</tr>
<tr>
<td><strong>Bed rest alone</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(possibly with drugs added later—4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Intermittent combined drugs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>alone, plus bed rest</td>
<td>372</td>
<td>37.0</td>
<td>143</td>
<td>71.5</td>
</tr>
<tr>
<td>(possibly with pnp. or pnx. later—38)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Collapse therapy, plus drugs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(10 without drugs)</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Pneumoperitoneum</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Pneumothorax</strong></td>
<td></td>
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<td></td>
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<tr>
<td><strong>Phrenic</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Extrapleural pnx., oleothorax, plombage</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total collapse</td>
<td>414</td>
<td>42.1</td>
<td>34</td>
<td>17.0</td>
</tr>
<tr>
<td><strong>Surgery, plus drugs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2 without drugs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Excision</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Thoracoplasty</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total surgery</td>
<td>199</td>
<td>19.9</td>
<td>12</td>
<td>6.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>999*</td>
<td>100.0</td>
<td>200</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*On case 8 only 99 answers.
†6 added phrenic crush to pnp.
**17 added phrenic crush to pnp.
††93 additional men gave pnp. plus surgery and these 33 are carried under Surgery

**RESUMEN**

Un resumen y una reducción de radiografías de tórax entamaño 4 x 5, de 10 casos comunmente observados de los tipos de tuberculosis, se envió a 100 médicos especialistas del pecho, escogidos por nuestro comité como representativos del más elevado pensamiento clínico en las áreas respectivas en los Estados Unidos de Norteamérica. A cada consultante se pidió su opinión sobre el tratamiento. Un estudio preliminar semejante se hizo en 1948 usando los mismos 10 casos. En el estudio presente, las 1000 contestaciones (10 por cada uno de los 100 médicos) se analizaron y dieron una buena información en corte del modo de pensar actual en el tratamiento de la tuberculosis.
RESUME

L'auteur a envoyé à cent spécialistes des poumons une observation résumée et des réductions radiographiques de dix cas de tuberculose pulmonaire banale. Ces cent médecins ont été choisis dans l'ensemble des États-Unis par le Comité, comme représentant les cliniciens les plus avisés de leur région. En utilisant les mêmes dix observations, une étude semblable avait été réalisée en 1948.

Dans l'étude qui est présentée aujourd'hui, les mille réponses (dix pour chacun des cent médecins) ont été étudiées et donnent une bonne vue d'ensemble de l'opinion générale concernant le traitement de la tuberculose pulmonaire.

ACKNOWLEDGMENTS

The authors wish to thank the 100 physicians whose participation made this analysis possible. Also to thank Mrs. Lucile Hughes for her technical assistance and Miss Ella Demuth for the photographic work.

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*Since this report has been prepared, the Committee on Non-Surgical Treatment has been enlarged.