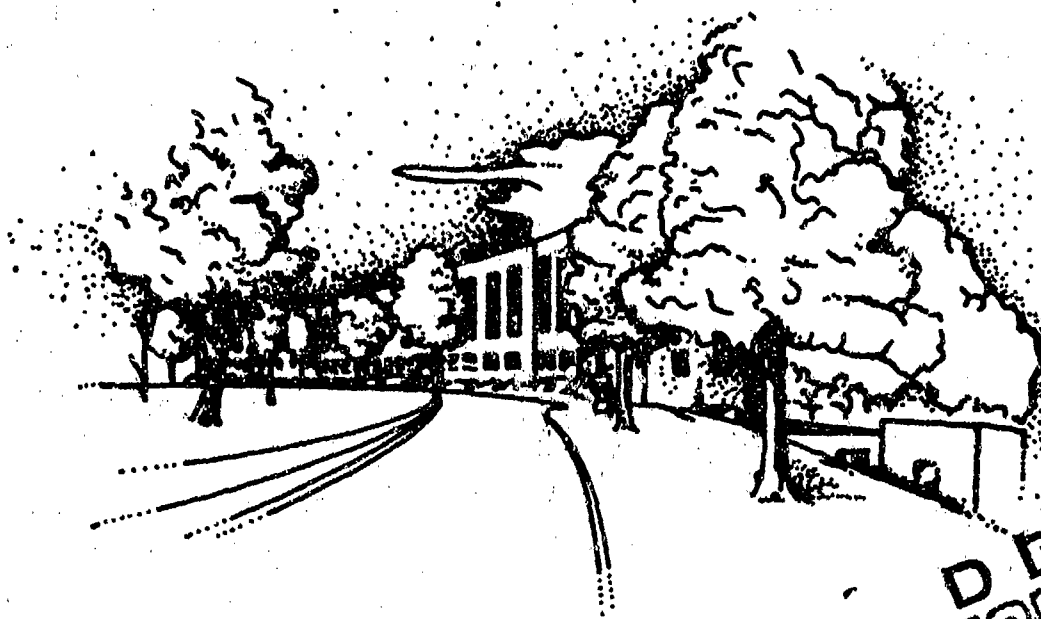


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**NAVAL MEDICAL RESEARCH INSTITUTE
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RECOMPRESSION TREATMENT TABLES USED
THROUGHOUT THE WORLD BY GOVERNMENT AND
INDUSTRY

T.E. Berghage, J. Vorosmarti, Jr., and
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NAVAL MEDICAL RESEARCH AND DEVELOPMENT COMMAND

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PREFACE

In many areas of endeavor we tend to perpetuate ideas without fully understanding their origins or without seeking contrary opinions. One such area is recompression therapy for diving casualty. Since the late 1800's, recompression of diving casualties has been accepted as the treatment of choice. This acceptance, however, has been based primarily upon clinical experience; very little experimental data are available on the topic. The clinical evidence is of limited value because so many diving organizations have adopted the procedures of the U.S. Navy and thus have restricted their experience. The authors believe it is the time to take a fresh look at recompression procedure in an effort to improve its efficacy. This report is intended as a starting point for such reevaluation. It should be considered a statement-of-the-art document in that it covers the history of recompression procedures in the U.S. Navy and surveys the procedures used throughout the world. We hope this compilation of treatment tables, along with the brief history, will be helpful to the diving community.

The inclusion of a treatment table in this report is in no way meant to be an endorsement of the table for use in recompression therapy. In fact, some of the older tables in this report are downright dangerous.

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Naval Medical Research and Development Command, Research Task M0099-PN.001-1190. The opinions and assertions contained herein are the private ones of the writers and are not to be construed as official or reflecting the views of the Navy Department or the Naval Service at large.

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BACKGROUND

The affliction (decompression sickness) identified by Pol and Watelle (1854) and later described by Bert (1878) opened a new research area for preventive and therapeutic medicine. The decompression procedures developed by Haldane in the early 1900's greatly reduced the incidence of decompression sickness to a manageable level, but Haldane's approach and its subsequent modifications have not eliminated the problem. Because a certain percentage of persons undergoing decompression are going to be stricken with decompression sickness, an adequate therapeutic regimen will always be necessary.

The beneficial effects of recompression were recognized early. During the building of the Brooklyn Bridge, Smith (1873) had a special iron treatment lock (9 ft by 3 1/2 ft) built. Workers stricken with decompression sickness were recompressed in this lock to a pressure equal to that at which they had been working previously; when the pain was relieved, the pressure was gradually reduced over a period of several hours.

Overwhelming evidence that recompression was the treatment of choice in handling decompression sickness was provided by Keays in 1909. But recompression treatment procedures varied depending upon who was in charge. Neither the extent of recompression nor the subsequent decompression schedule were standardized in any way. Ryan (1912) suggested that recompression should be to a pressure equivalent to two-thirds of the original working pressure. In 1917 the New York Public Service Commission adopted the policy of recompressing stricken patients to the pressure at which they had been working originally (Levy 1917). Recompression treatment procedures made little significant progress until about 1920 because of the lack of experimental data and the fragmented, nonuniform clinical evidence. In 1924 the U.S. Navy published in its Diving Manual the first standard recompression treatment procedure.

The results of treatments using the Navy's air recompression procedure were not completely successful. Over 50% of the individuals treated suffered a recurrence of symptoms. The air treatment afforded relief in mild cases of decompression sickness, but often failed in the more serious cases.

Several early investigators had suggested, based on theoretical grounds, that the use of oxygen might be beneficial in the treatment of decompression sickness. In 1937 Behnke and Shaw conducted empirical research on the subject, and in 1944 an oxygen treatment table was promulgated in a News Letter distributed by the Bureau of Medicine and Surgery, U.S. Department of the Navy. Reports from the field and experience at the Navy Experimental Diving Unit showed that neither the new oxygen treatment table nor the air treatment table included in a U.S. Navy Diving Manual available in 1942 produced the desired therapeutic results. Recurrence of symptoms still ran about 50% of those treated. To verify field reports and to formulate adequate and comprehensive tables for the treatment of decompression sickness and air embolism, investigators at the Naval Medical Research Institute (NMRI) and the Navy Experimental Diving Unit (NEDU) performed a series of tests (Van Der Aue, White, Hayter, Brinton, Kellar, and Behnke 1945). The details and experimental results of this study will be considered in depth

because of their impact on treatment procedure used here and around the world.

In these experiments, 33 Navy enlisted men served as subjects who made hard-working dives to 130 feet for 1 hour using standard U.S. Navy decompression schedules. The subjects were recompressed on the treatment table under evaluation 30 to 60 minutes after surfacing from the dive.

To allow the reader access to the actual results obtained, we quote verbatim the results from Van Der Aue, O. E., W. A. White, Jr., R. Hayter, E. S. Brinton, R. J. Kellar, and A. R. Behnke. 1945. Physiological factors underlying the prevention and treatment of decompression sickness. Project X-443, Rpt. No. 1, U.S. Naval Medical Research Institute, Bethesda, Md., 26 April.

The purpose of a work dive prior to the application of the treatment table was to saturate the body tissues with nitrogen to such degree that a second exposure unless followed by prolonged decompression would be certain to produce bends. For example, following a work dive, the application of the treatment decompression outlined in the table published in the BUMED News Letter gave rise to bends in six out of ten individuals and it was necessary to recompress three of the men in order to alleviate symptoms. When the treatment table, however, was modified to include an additional hour of decompression, no symptoms developed. This illustrates the critical nature of the time factor that separates safe treatment from treatment that is inadequate.

The failure of bends to develop following the application of the second or "treatment" decompression was, therefore, the criterion used to determine adequacy of treatment. (p. 4)

Experimental Results [pp. 5-8]

Tests of the Bumed News Letter 165-foot air-oxygen treatment table.-
This table provides for the following treatment for patients whose only symptom is pain:

Depth (feet of sea water)	165	140	120	100	80	60	50	40	To surface
Time at depth (minutes)	30	12	12	12	12	30*	30*	30*	5*

*Breathing oxygen.

Ten subjects were exposed to the pressures of the table one hour after the wet dive. Three subjects (Abe, Mey, Cun) developed joint pain requiring recompression for relief after completion of the treatment table. Three subjects (Pac, Sim, Bun) had mild pain lasting fifteen to twenty minutes

but recompression was not necessary to relieve the pain...† This confirmed the field reports that the 165-foot treatment table was not entirely satisfactory.

Tests of modifications of the Bumed News Letter 165-foot treatment table.-
In an attempt to rectify the apparent inadequacies of the table, an additional thirty minutes of oxygen breathing was added at 30 feet according to the following table:

Depth (feet of sea water)	165	140	120	100	80	60	50	40	30	To surface
Time at depth (minutes)	30	12	12	12	12	30*	30*	30*	30*	5*

*Breathing oxygen.

One of the two divers subjected to this modified table developed joint pain requiring recompression after surfacing....These findings indicated that the table as modified was not satisfactory.

The addition of sixty minutes of oxygen breathing at 30 feet was required to make the table effective:

Depth (feet of sea water)	165	140	120	100	80	60	50	40	30	To surface
Time at depth (minutes)	30	12	12	12	12	30*	30*	30*	60*	5*

*Breathing oxygen.

Following the work dive three men (Kos, Kra, and Kes) developed bends within a period of one hour after decompression. To these three and the remaining eight men performing the work dive, the above outlined table of recompression was applied. Bends did not develop or recur subsequently....There were no symptoms indicative of oxygen poisoning.

Tests of 165-foot air treatment tables.- The following modification of the air treatment table of the Bumed News Letter was tested:

Depth (feet of sea water)	165	140	120	100	80	60	50	40	30	20	10
Time at depth (minutes)	30	12	12	12	12	30	30	30	240	120	120

Two subjects exposed to the pressure of this table one hour after the 130-foot dive and four subjects exposed thirty minutes after the dive complained of fatigue following the test....

†References to table numbers in the quoted report have been deleted to avoid confusion with table numbers pertinent to the present report.

The table was further modified as follows:

Depth (feet of sea water)	165	140	120	100	80	60	50	40	30	20	10
Time at depth (minutes)	30	12	12	12	12	30	30	30	120	120	240

Two subjects were exposed to the pressures of this table one hour after the 130-foot dive and four subjects thirty minutes after the dive. All the subjects remained completely asymptomatic....

Tests of a 100-foot air-oxygen treatment table.- The following table, developed by Yarbrough and Behnke (2) and Behnke (7), was tested:

Depth (feet of sea water)	100	80	60	50	40	To surface
Time of depth (minutes)	30	12	30*	30*	30*	5*

*Breathing oxygen.

Tests were performed under two conditions: (a) one hour after exposure to the usual 130-foot dive and (b) thirty minutes after the 130-foot dive. None of twelve subjects exposed to the pressures of this treatment table thirty minutes after the wet dive developed symptoms of caisson disease....Twelve subjects remained asymptomatic after exposure to the pressures of this treatment table one hour after the 130-foot dive....This table was considered to be satisfactory.

Tests of a 100-foot air treatment table.- The following 100-foot air treatment table, a modification of the 150-foot air treatment table of the Diving Manual (7), was devised:

Depth (feet of sea water)	100	80	60	50	40	30	20	10
Time at depth (minutes)	30	12	30	30	30	60	60	120

The table was tested under two conditions: (a) thirty minutes after exposure to the usual 130-foot dive and (b) one hour after the 130-foot dive. None of eight subjects had symptoms of caisson disease following exposure to the pressures of the treatment table thirty minutes after the wet dive....All three subjects were asymptomatic after exposure to the treatment table one hour after the wet dive....This table was also considered to be satisfactory.

Tests of treatment tables providing for prolonged recompression.- The following table was tested without a preceding 130-foot dive:

Depth (feet of sea water)	165	140	120	100	80	60	50	40	30	20	10
Time at depth (minutes)	120	12	12	12	12	120* 22 hr.	120	120	120	120	120

*Breathing oxygen.

Six subjects were exposed to the pressures of this table. All the subjects were extremely fatigued on surfacing. Three subjects developed substernal soreness on deep inspiration at the 60-foot depth while breathing oxygen and one who did not breathe oxygen also suffered from substernal soreness after three hours at 60 feet. Two subjects had numbness of the fingers throughout the period of oxygen breathing and one had mild nausea during the last thirty minutes of oxygen breathing. Four subjects developed joint pain after surfacing, two of whom required recompression for relief of the symptom....It appeared that the table was faulty in the following respects: too rapid decompression from 165 to 60 feet, the danger of oxygen poisoning as a result of the two-hour period of oxygen breathing at 60 feet, prolonged breathing of dense air at 60 feet, and too rapid decompression from 60 feet to the surface.

The table was modified as follows:

Depth (feet of sea water)	165	140	120	100	80	60	50	40	30	20	10
Time at depth (minutes)	120	30	30	30	30	6 hr.	6 hr.	6 hr.	12 hr.	120	120

Six subjects were exposed to the pressures of this table without a previous wet dive. None developed joint pain, paresthesias, substernal soreness or nausea, but all were moderately fatigued after surfacing. Two subjects developed moderate frontal headache, one at the 20-foot depth and the other six hours after surfacing....

Tests of a decompression table for tenders.- The following table was tested:

Depth (feet of sea water)	165	140	120	100	80	60	50	40	30	To surface
Time at depth (minutes)	30	12	12	12	12	30	30	30	60*	5*

*Breathing oxygen.

Ten subjects were exposed to the pressures of this table without a preceding wet dive. None of the subjects developed symptoms of caisson disease....

The results of the Van Der Aue, et al. (1945) study provided the treatment tables that were used by the U.S. Navy and many foreign countries until about 1965. It is interesting to note that these widely accepted treatment procedures are based upon a study involving only 33 subjects and that some of the individual treatment tables are based on as few as 6 subjects. Another interesting point is that in most cases the treated subjects did not actually have manifest symptoms of decompression sickness prior to the therapeutic recompression. In several instances they were symptom-free prior to recompression-experienced decompression sickness during the treatment. The treatment tables were extended until all subjects could tolerate both the initial pressure exposure and the therapeutic recompression without manifesting symptoms of decompression sickness.

This study and the resulting recompression treatment tables stood as the U.S. Navy's treatment procedure for the next 20 years. During this time these tables, or slight modifications of them, were adopted by several foreign navies and numerous foreign and domestic commercial companies. As evidence accumulated it became apparent that the success rate for the more severe cases of decompression sickness was considerably lower than desired. Rivera (1964) published a statistical evaluation of the treatment tables, which showed the following success rates following an initial recompression and after repeated treatments.

Treatment table	Success rate following first recompression (%)	Final success rate (%)
1	92	100
1A	86	98
2	91	99
2A	90	99
3 O ₂	93	96
3 Air	80	90
4 Air	55	61
4 O ₂	42	42
4 He-O ₂	33	42

Failure rates for the initial recompression and lack of success in treating severe cases of decompression sickness led Goodman and Workman (1965) to the development of the minimal-recompression oxygen treatment table. Often called simply "the oxygen treatment table," it has been widely used throughout the world. It is still the treatment of choice.

The one area in which a recompression treatment problem still exists is in the handling of decompression sickness cases in which the symptoms appear while the patient is still exposed to increased ambient pressure. Such cases often occur during deep saturation dives and excursion dives from saturation depths.

Berghage (1976) reports that the initial recompression success rate in treating these cases is only about 35%. Future research efforts must focus attention on this problem area.

The compilation of treatment tables provided on the following pages was undertaken to provide a treatment-table reference guide for those activities engaged in hyperbaric medicine. It could also provide a starting point for future recompression-therapy research. It is hoped that this compilation of treatment tables along with the brief history of the development of the U.S. Navy tables will be helpful to the diving community.

FIGURE 1

U.S. NAVY 1943 100-FOOT AIR TREATMENT TABLE*

1. Use--treatment of decompression sickness where relief is obtained at or less than a depth of 66 feet.
2. Descent rate--25 ft/min (7.6 m/min).
3. Ascent rate--less than 25 ft/min (7.6 m/min).
4. Time at treatment depth does not include the compression time. Compression to a depth of relief, or to 100 feet, whichever is deeper.

Depth (ft) (meters)		Time (min)	Breathing media	Total elapsed time (hours) (min)	
100	30	30	Air		34
40	12	14	Air		51
30	9	42	Air	1	34
20	6	52	Air	2	27
10	3	68	Air	3	36
10-0	3-0	1	Air	3	37

*U.S. Navy Diving Manual (1943).

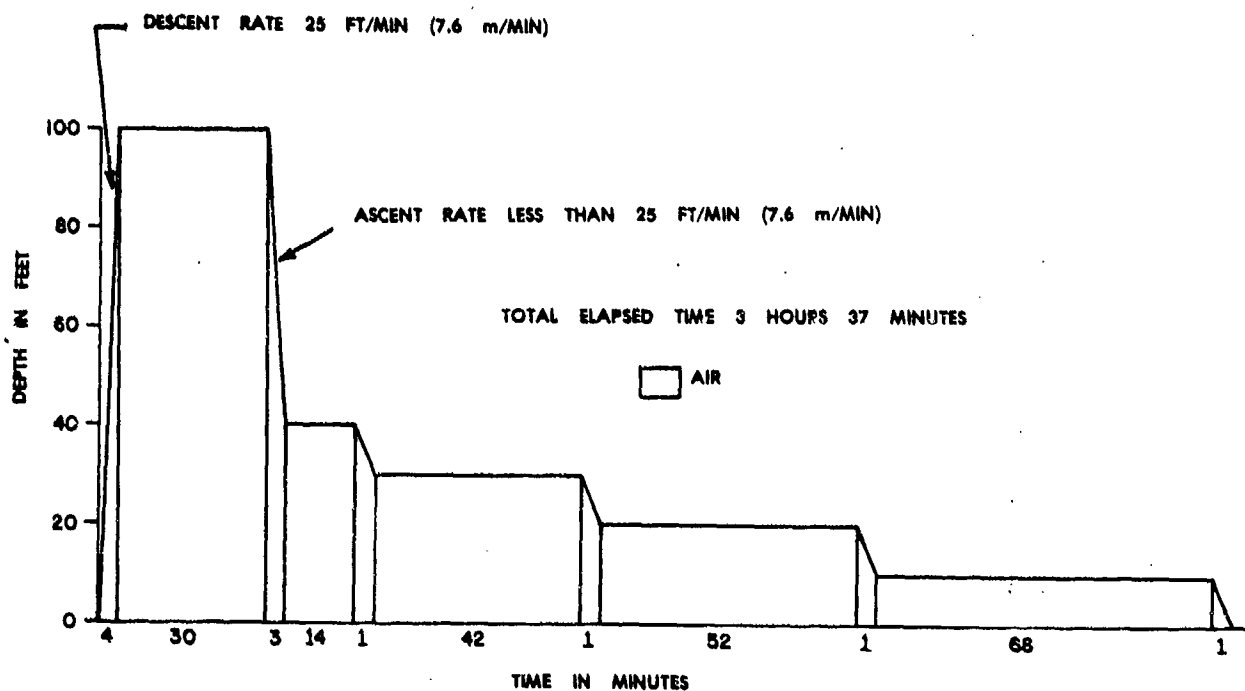


FIGURE 2

U.S. NAVY 1943 150-FOOT AIR TREATMENT TABLE*

1. Use--treatment of decompression sickness where relief is obtained at or less than a depth of 116 feet.
2. Descent rate--25 ft/min (7.6 m/min).
3. Ascent rate--less than 25 ft/min (7.6 m/min) between stops.
4. Time at treatment depth does not include the compression time. Compression is carried out to a depth 34 feet deeper than the depth of relief. If relief is obtained at a depth between 101 and 116 feet, use the decompression procedure listed.

Depth (ft) (meters)		Time (min)	Breathing media	Total elapsed time (hours) (min)	
150	46	30	Air		36
60	18	22	Air	1	2
50	15	30	Air	1	33
40	12	35	Air	2	9
30	9	42	Air	2	52
20	6	52	Air	3	45
10	3	68	Air	4	54
10-0	3-0	1	Air	4	55

*U.S. Navy Diving Manual (1943).

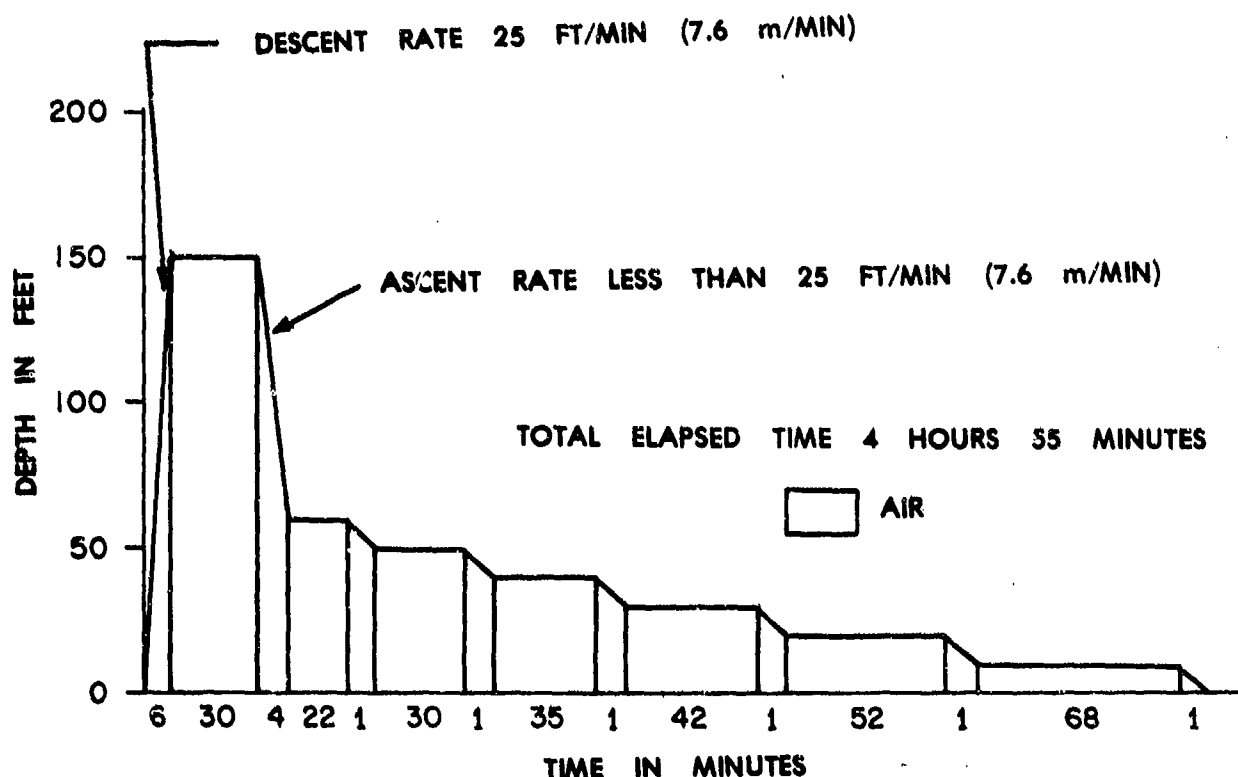


FIGURE 3

U.S. NAVY 1943 200-FOOT AIR TREATMENT TABLE*

1. Use--treatment of decompression sickness where relief is obtained at or less than a depth of 166 feet.
2. Descent rate-- 25 ft/min (7.6 m/min).
3. Ascent rate--less than 25 ft/min (7.6 m/min) between stops.
4. Time at treatment depth does not include the compression time. Compression is carried out to a depth 34 feet deeper than the depth of relief. If relief is obtained at a depth between 151 and 166 feet, use the decompression procedure listed.

Depth (ft) (meters)		Time (min)	Breathing media	Total elapsed time (hours) (min)	
200	61	30	Air		38
90	27	7	Air		50
80	24	22	Air	1	13
70	21	24	Air	1	38
60	18	26	Air	2	5
50	15	30	Air	2	36
40	12	35	Air	3	12
30	9	42	Air	3	55
20	6	52	Air	4	48
10	3	68	Air	5	57
10-0	3-0	1	Air	5	58

*U.S. Navy Diving Manual (1943).

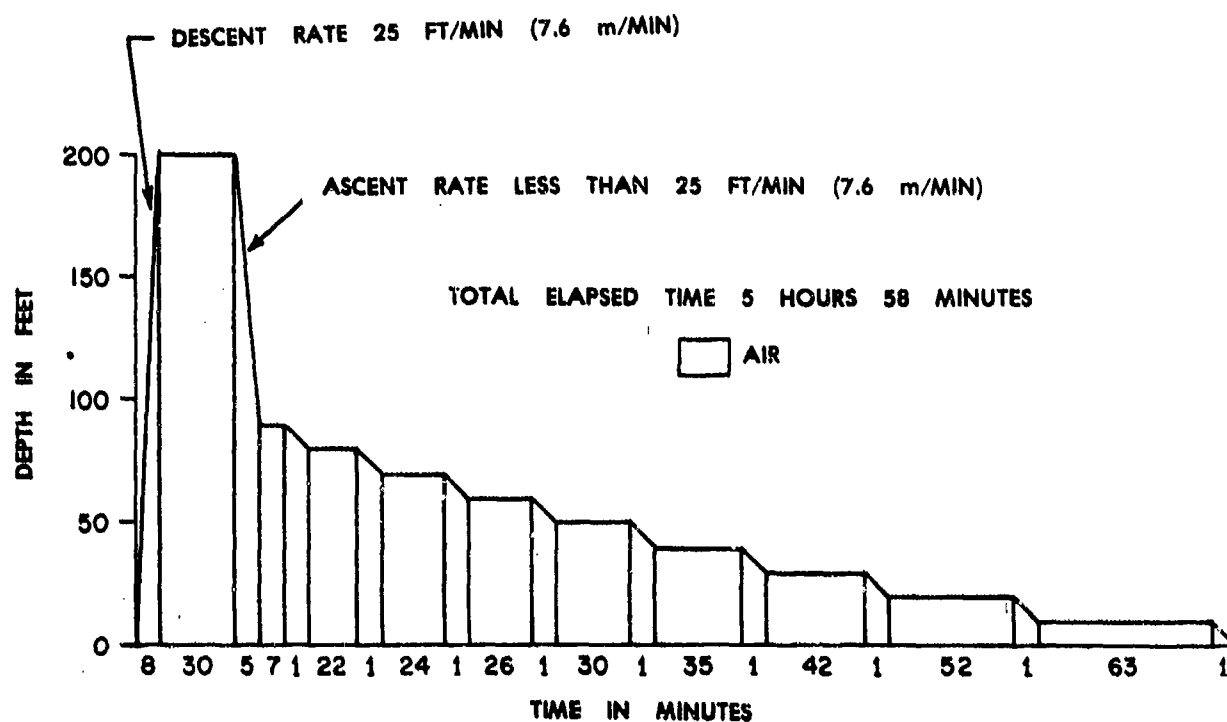


FIGURE 4

U.S. NAVY 1943 250-FOOT AIR TREATMENT TABLE*

1. Use--treatment of decompression sickness where relief is obtained at or less than a depth of 216 feet.
2. Descent rate--25 ft/min (7.6 m/min).
3. Ascent rate--less than 25 ft/min (7.6 m/min) between stops.
4. Time at treatment depth does not include the compression time. Compression is carried out to a depth 34 feet deeper than the depth of relief. If relief is obtained at a depth between 201 and 216 feet, use the decompression procedure listed.

Depth (ft) (meters)		Time (min)	Breathing media	Total elapsed time (hours) (min)	
250	76	30	Air		40
110	34	13	Air		59
100	30	18	Air	1	18
90	27	19	Air	1	38
80	24	22	Air	2	1
70	21	24	Air	2	26
60	18	26	Air	2	53
50	15	30	Air	3	24
40	12	35	Air	4	0
30	9	42	Air	4	43
20	6	52	Air	5	36
10	3	68	Air	6	45
10-0	3-0	1	Air	6	46

*U.S. Navy Diving Manual (1943).

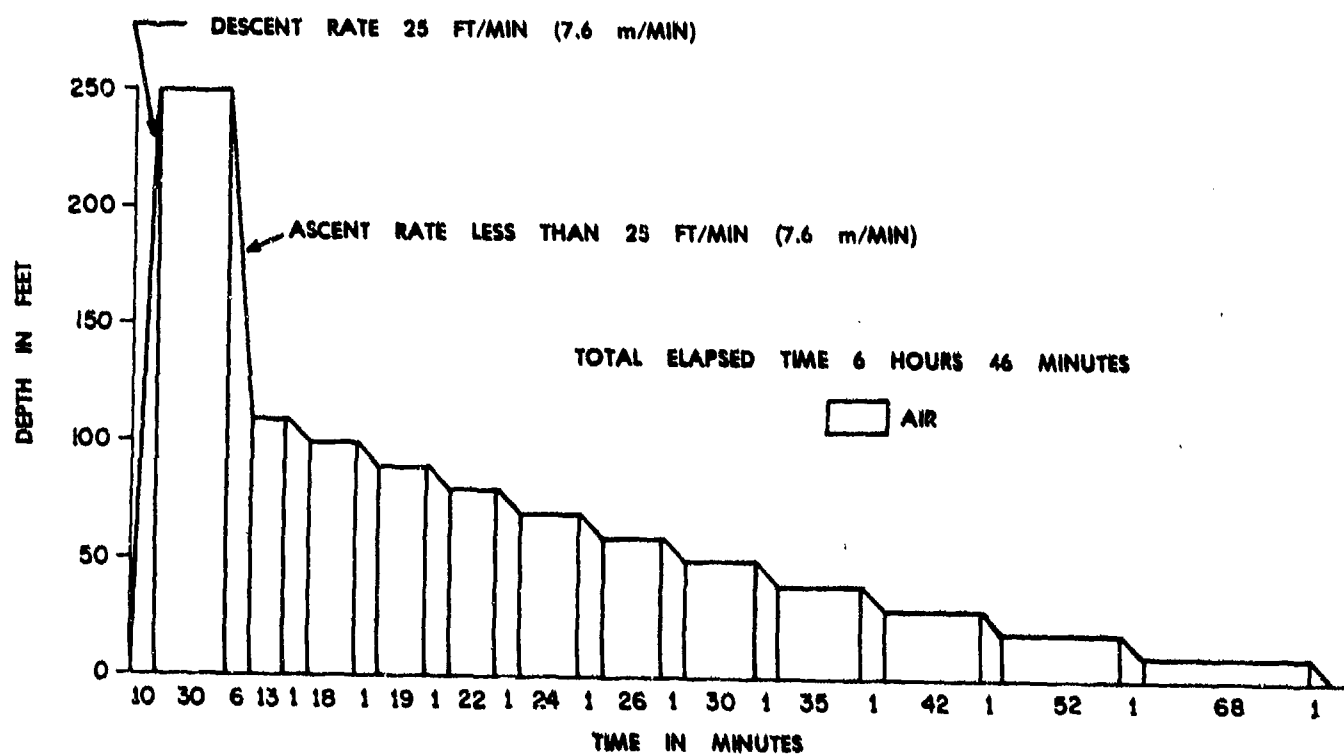


FIGURE 5

U.S. NAVY 1943 300-FOOT AIR TREATMENT TABLE*

1. Use--treatment of decompression sickness where relief is obtained at or less than a depth of 266 feet.

2. Descent rate--25 ft/min (7.6 m/min).

3. Ascent rate--less than 25 ft/min (7.6 m/min) between stops.

4. Time at treatment depth does not include the compression time. Compression is carried out to a depth 34 feet deeper than the depth of relief. If relief is obtained at a depth between 251 and 266 feet, use the decompression procedure listed.

*U.S. Navy Diving Manual (1943).

Depth (ft) (meters)	Time (min)	Breathing media	Total elapsed time (hours) (min)
300 91	30	Air	42
140 43	4	Air	53
130 40	14	Air	1 8
120 37	16	Air	1 25
110 34	16	Air	1 42
100 30	18	Air	2 1
90 27	19	Air	2 21
80 24	22	Air	2 44
70 21	24	Air	3 9
60 18	26	Air	3 36
50 15	30	Air	4 7
40 12	35	Air	4 43
30 9	42	Air	5 26
20 6	52	Air	6 19
10 3	68	Air	7 28
10-0 3-0	1	Air	7 29

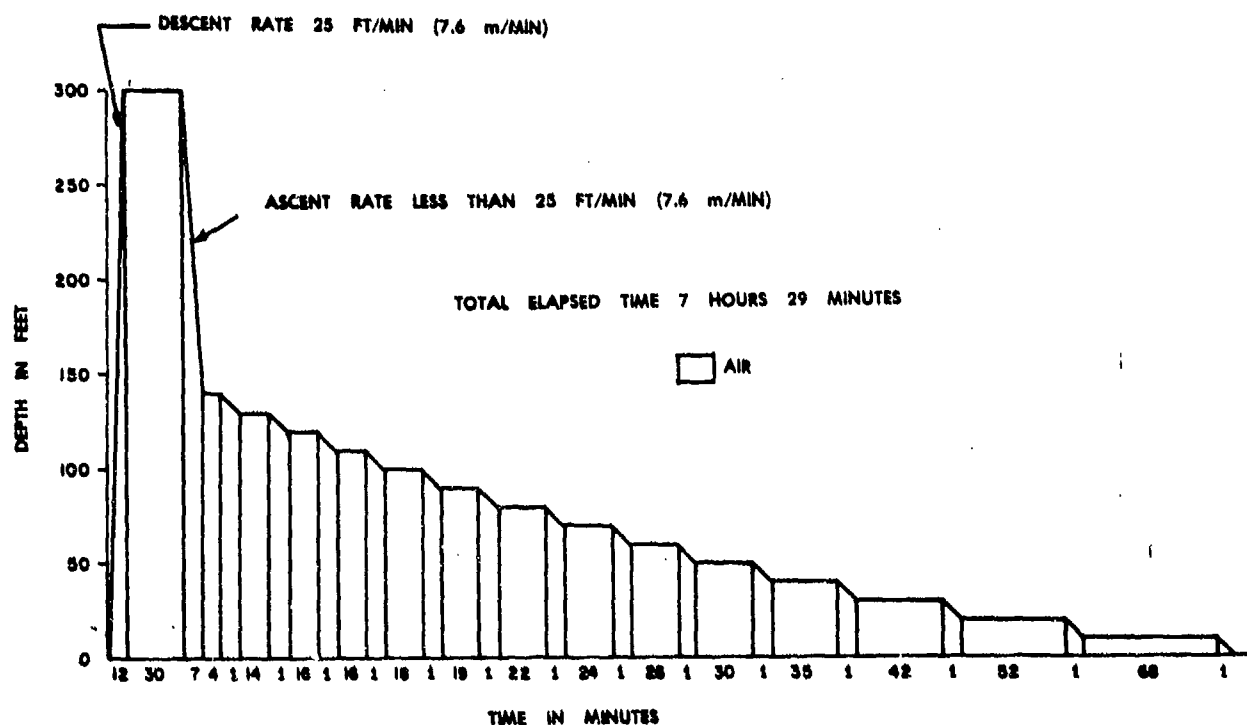


FIGURE 6

U.S. NAVY 1944 AIR RECOMPRESSION TREATMENT TABLE*

1. Use--treatment of mild decompression sickness when oxygen is not available or the patient cannot tolerate the elevated oxygen partial pressure.
2. Descent rate--25 ft/min.
3. Ascent rate--not to exceed 25 ft/min between stops.
4. Time at 165 feet does not include the compression time. Time between stops is included in the time at the next stop.

Depth (ft) (meters)		Time (min)	Breathing media	Total elapsed time (hours) (min)	
165	50	30	Air		37
140	43	12	Air		49
120	37	12	Air	1	1
100	30	12	Air	1	13
80	24	12	Air	1	25
60	18	26	Air	1	51
50	15	30	Air	2	21
40	12	35	Air	2	56
30	9	42	Air	3	38
20	6	52	Air	4	30
10	3	68	Air	5	38
10-0	3-0	1	Air	5	39

*Bumed News Letter (1944).

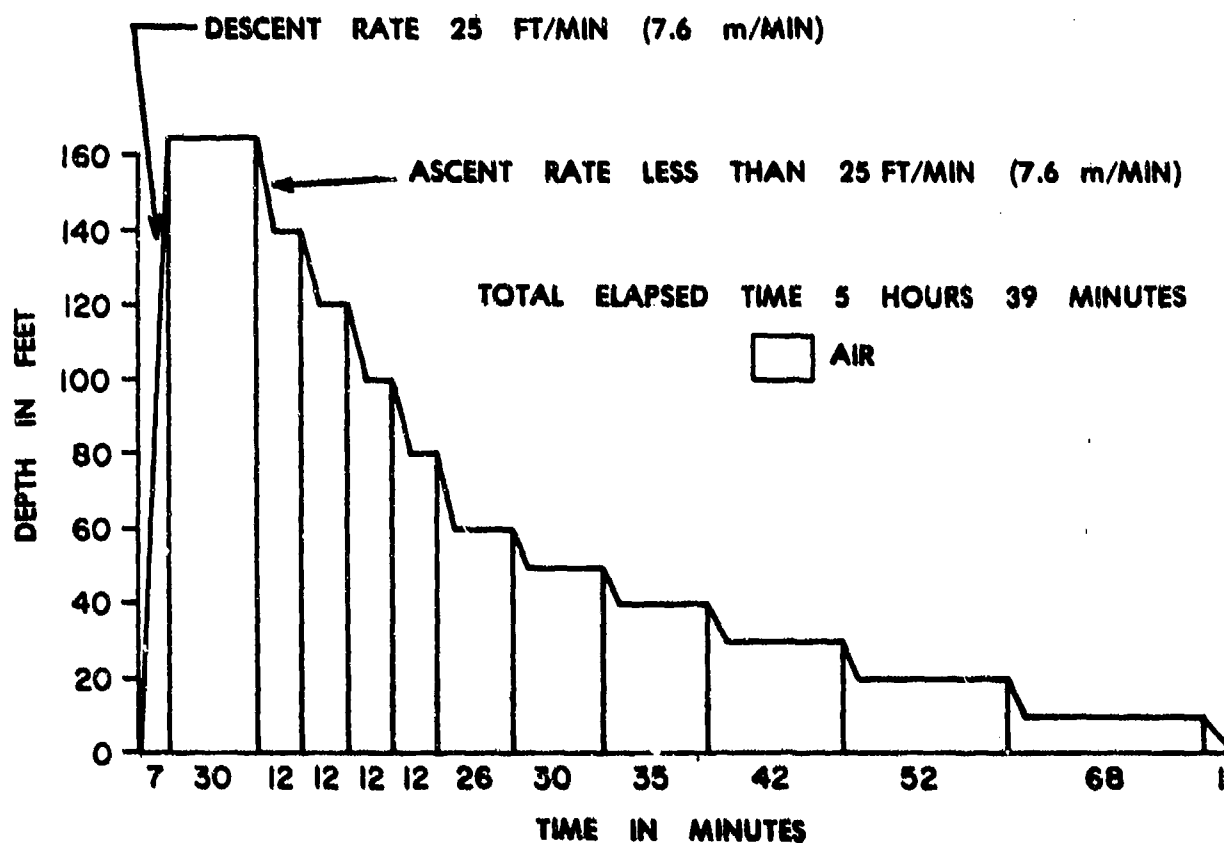


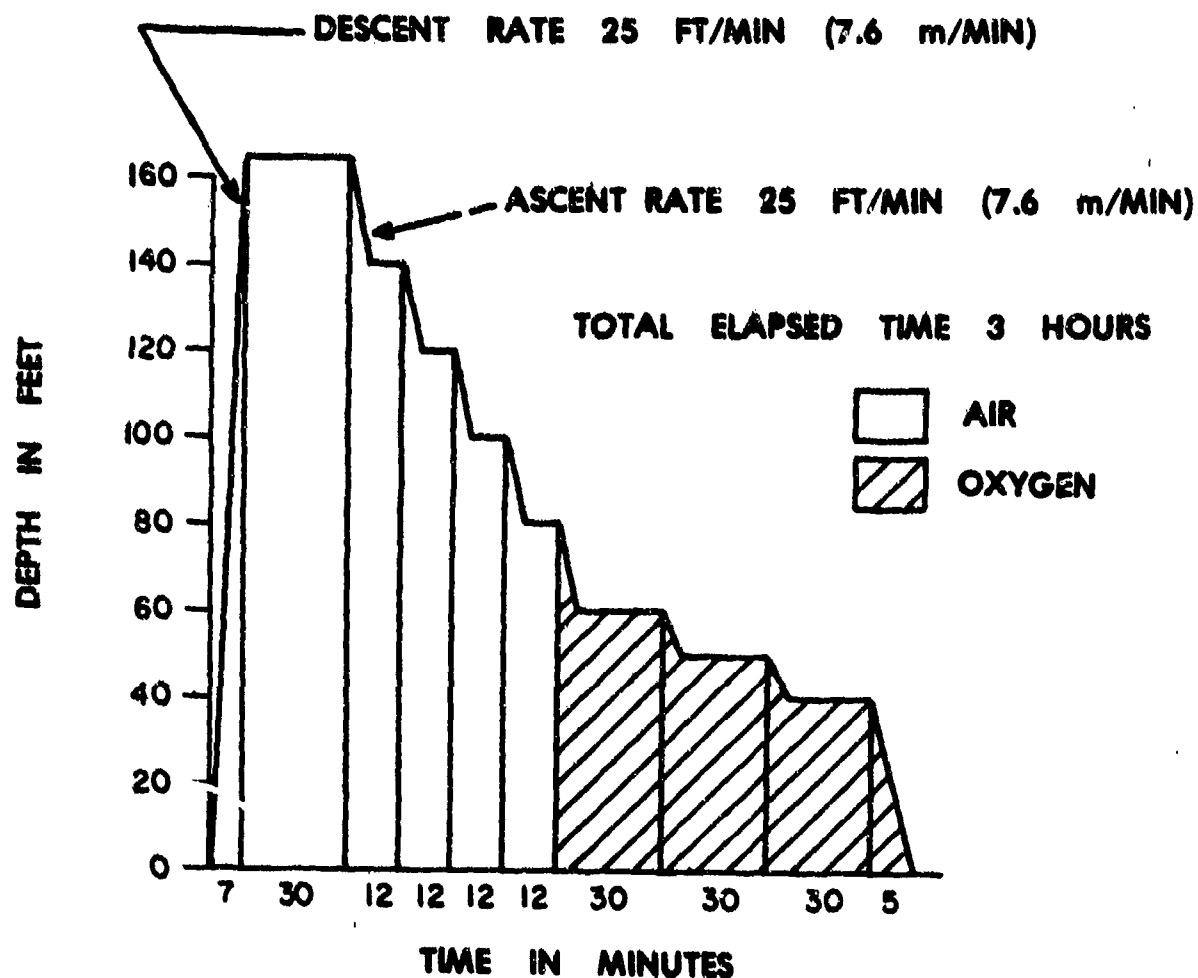
FIGURE 7

U.S. NAVY 1944 RECOMPRESSION TREATMENT TABLE WITH OXYGEN*

1. Use--treatment of mild decompression sickness when oxygen is available.
2. Descent rate--25 ft/min.
3. Ascent rate--not to exceed 25 ft/min between stops.
4. Time at 165 feet does not include the compression time. Time between stops is included in the time at the next stop.

Depth (ft) (meters)		Time (min)	Breathing media	Total elapsed time (hours) (min)	
165	50	30	Air		37
140	43	12	Air		49
120	37	12	Air	1	1
100	30	12	Air	1	13
80	24	12	Air	1	25
60	18	30	Oxygen	1	55
50	15	30	Oxygen	2	25
40	12	30	Oxygen	2	55
40-0	12-0	5	Oxygen	3	0

*Bumed News Letter (1944).



U.S. NAVY 1944 SHORT AIR RECOMPRESSION TREATMENT TABLE*

1. Use--treatment of mild decompression sickness when oxygen is not available or when it cannot be tolerated by the patient.

2. Descent rate--25 ft/min.

3. Ascent rate--1 minute between stops.

4. Time at 100 feet includes the compression time. Ascent time between stops is included in the time at the next stop.

Depth (ft) (meters)		Time (min)	Breathing media	Total elapsed time (hours) (min)	
100	30	30	Air		30
80	24	12	Air		42
60	18	26	Air	1	8
50	15	30	Air	1	38
40	12	35	Air	2	13
30	9	42	Air	2	55
20	6	52	Air	3	47
10	3	68	Air	4	55
10-0	3-0	10	Air	5	5

*Duffner, Van Der Aue, and Behnke (1948).

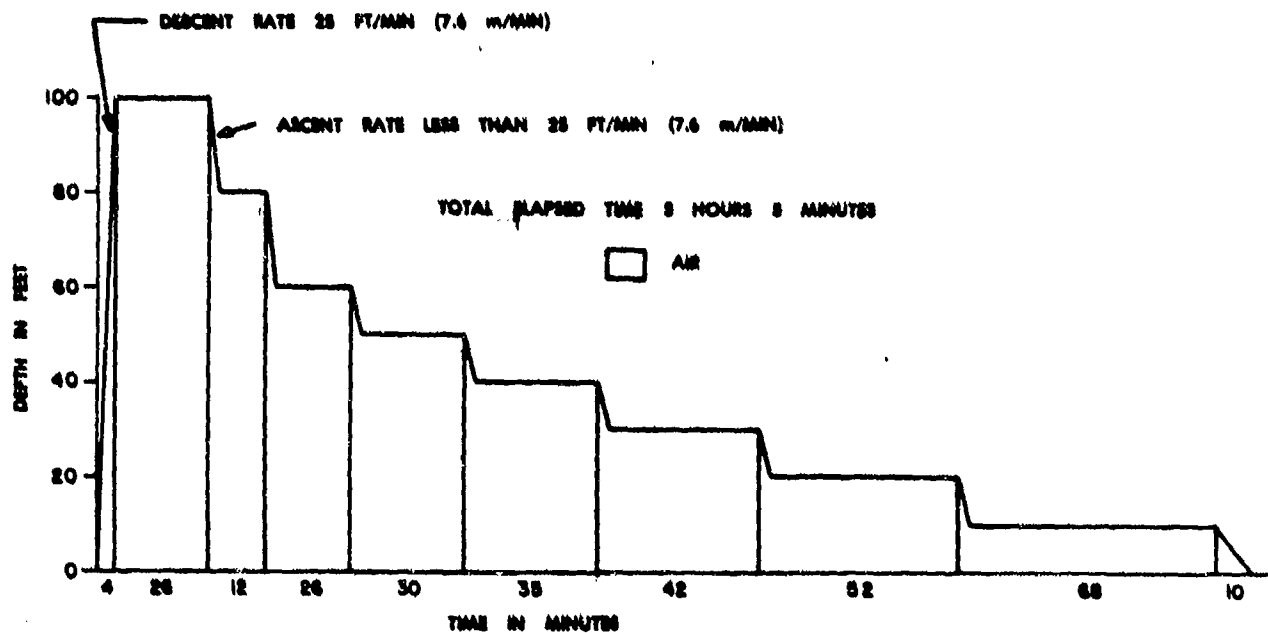


FIGURE 9

U.S. NAVY 1944 SHORT OXYGEN RECOMPRESSION TREATMENT TABLE*

1. Use--treatment of mild decompression sickness.

2. Descent rate--25 ft/min.

3. Ascent rate--1 minute between stops.

4. Time at 100 feet includes the compression time. Ascent time between stops is included in the time at the next stop.

Depth (ft) (meters)		Time (min)	Breathing media	Total elapsed time (hours) (min)	
100	30	30	Air		30
80	24	12	Air		42
60	18	30	Oxygen	1	12
50	15	30	Oxygen	1	42
40	12	30	Oxygen	2	12
30-0	9-0	5	Oxygen	2	17

*Duffner, Van Der Ave, and Behnke (1948).

FIGURE 10

U.S. NAVY 1944 LONG AIR RECOMPRESSION TREATMENT
TABLE*

1. Use--treatment of moderate to severe decompression sickness when oxygen is not available or cannot be tolerated by the patient.
2. Descent rate--25 ft/min.
3. Ascent rate--1 minute between stops.
4. Time at 165 feet includes the compression time. Ascent time between stops is included in the time at the next stop.

*Duffner, Van Der Aue, and Behnke (1948).

Depth (ft) (meters)		Time (min)	Breathing media	Total elapsed time (hours) (min)	
165	50	30	Air		30
140	43	12	Air		42
120	37	12	Air		54
100	30	12	Air	1	6
80	24	12	Air	1	18
60	18	26	Air	1	44
50	15	30	Air	2	14
40	12	35	Air	2	49
30	9	42	Air	3	31
20	6	52	Air	4	23
10	3	68	Air	5	26
10-0	3-0	10	Air	5	36

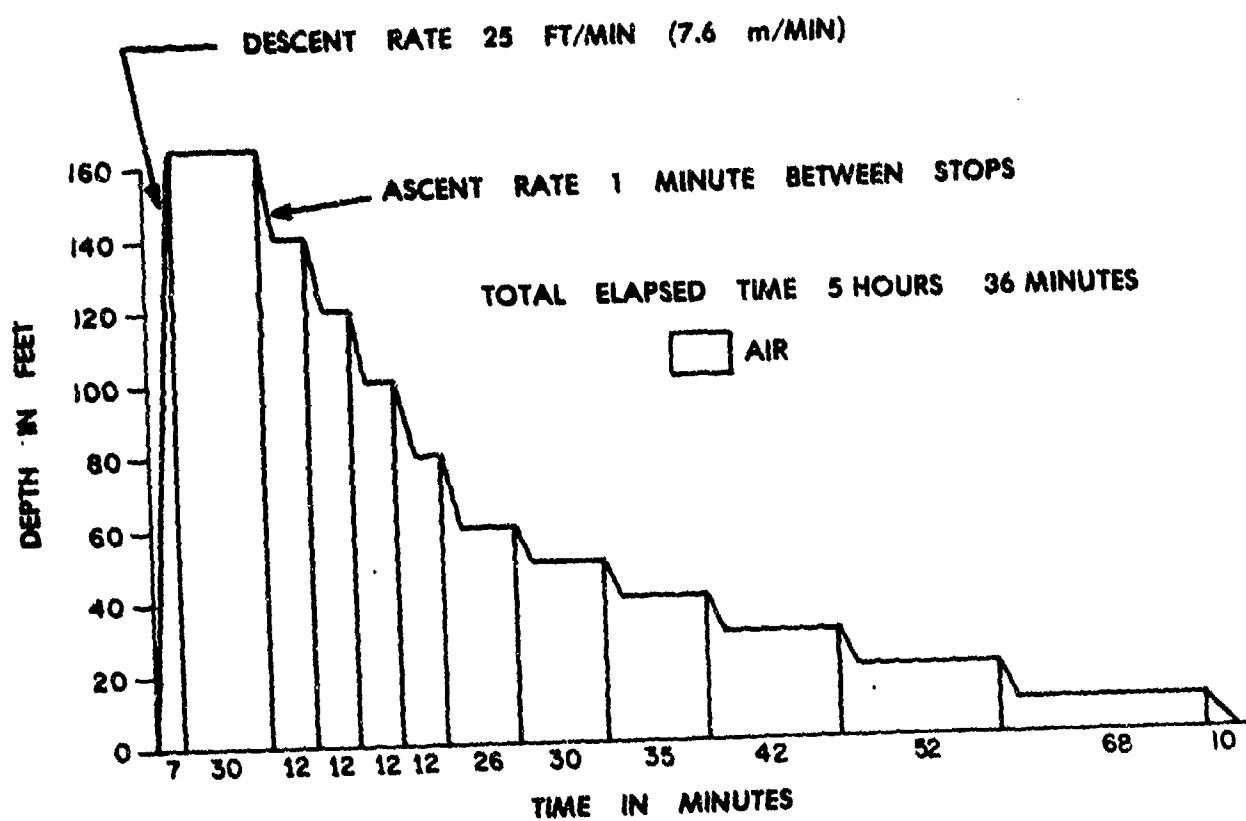


FIGURE 11

U.S. NAVY 1944 LONG OXYGEN RECOMPRESSION TREATMENT TABLE*

1. Use--treatment of moderate to severe decompression sickness.
2. Descent rate--25 ft/min.
3. Ascent rate--1 minute between stops.
4. Time at 165 feet includes the compression time. Ascent time between stops is included in the time at the next stop.

*Duffner, Van Der Aue, and Behnke (1948).

Depth (ft) (meters)		Time (min)	Breathing media	Total elapsed time (hours) (min)	
165	50	30	Air		30
140	43	12	Air		42
120	37	12	Air		54
100	30	12	Air	1	6
80	24	12	Air	1	18
60	18	30	Oxygen	1	48
50	15	30	Oxygen	2	18
40	12	30	Oxygen	2	48
30-0	9-0	5	Oxygen	2	53

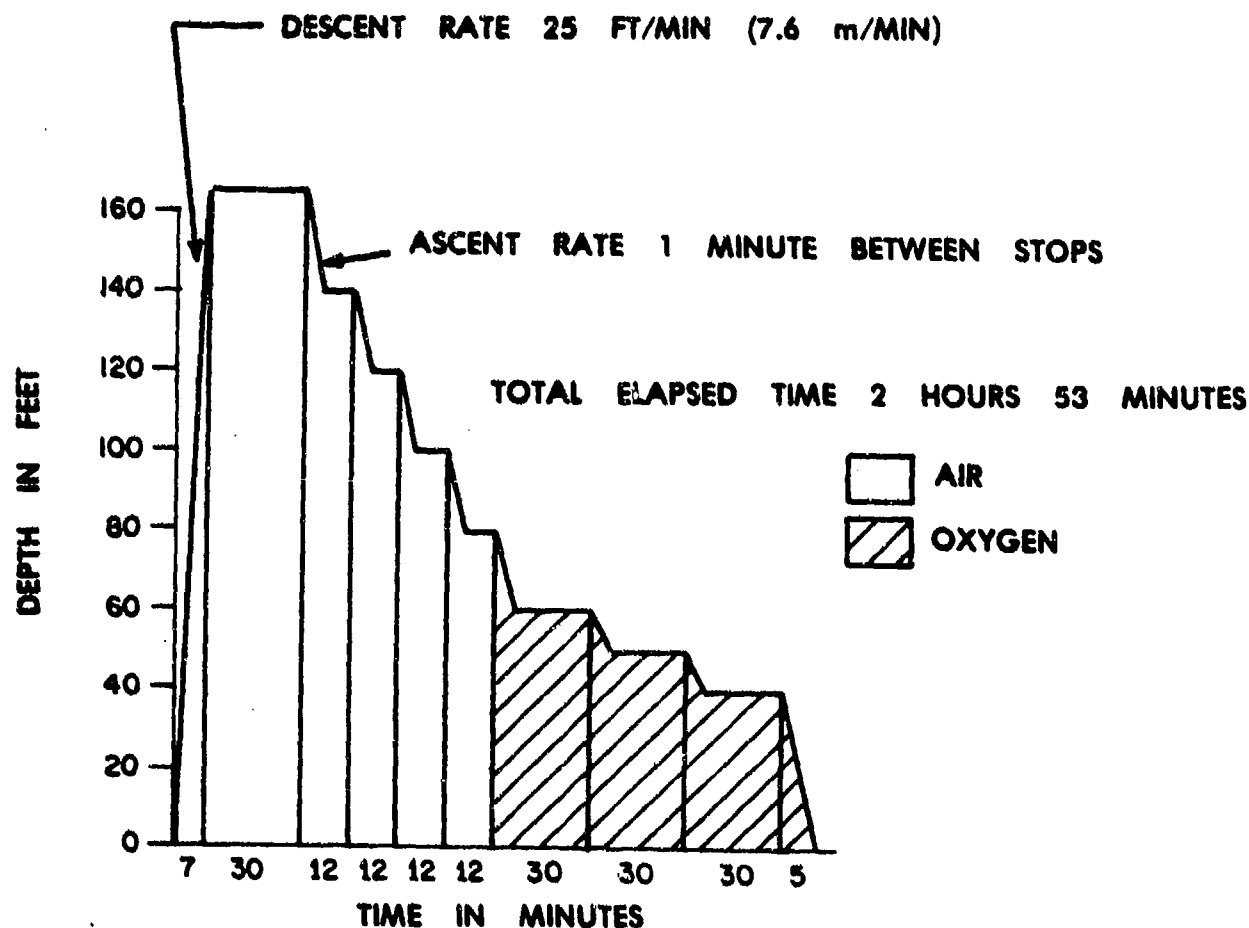


Figure 12

U.S. NAVY RECOMPRESSION TREATMENT TABLE 1*

1. Use--treatment of pain-only decompression sickness when oxygen is available and pain is relieved at a depth less than 66 feet.

2. Descent rate--25 ft/min.

3. Ascent rate--1 minute between stops.

4. Time at 100 feet includes time from the surface.

Depth (ft) (meters)		Time (min)	Breathing media	Total elapsed time (hours) (min)	
100	30	30	Air		30
80	24	12	Air		43
60	18	30	Oxygen	1	14
50	15	30	Oxygen	1	45
40	12	30	Oxygen	2	16
30-0	9-0	5	Oxygen	2	21

*U.S. Navy Diving Manual (1958).

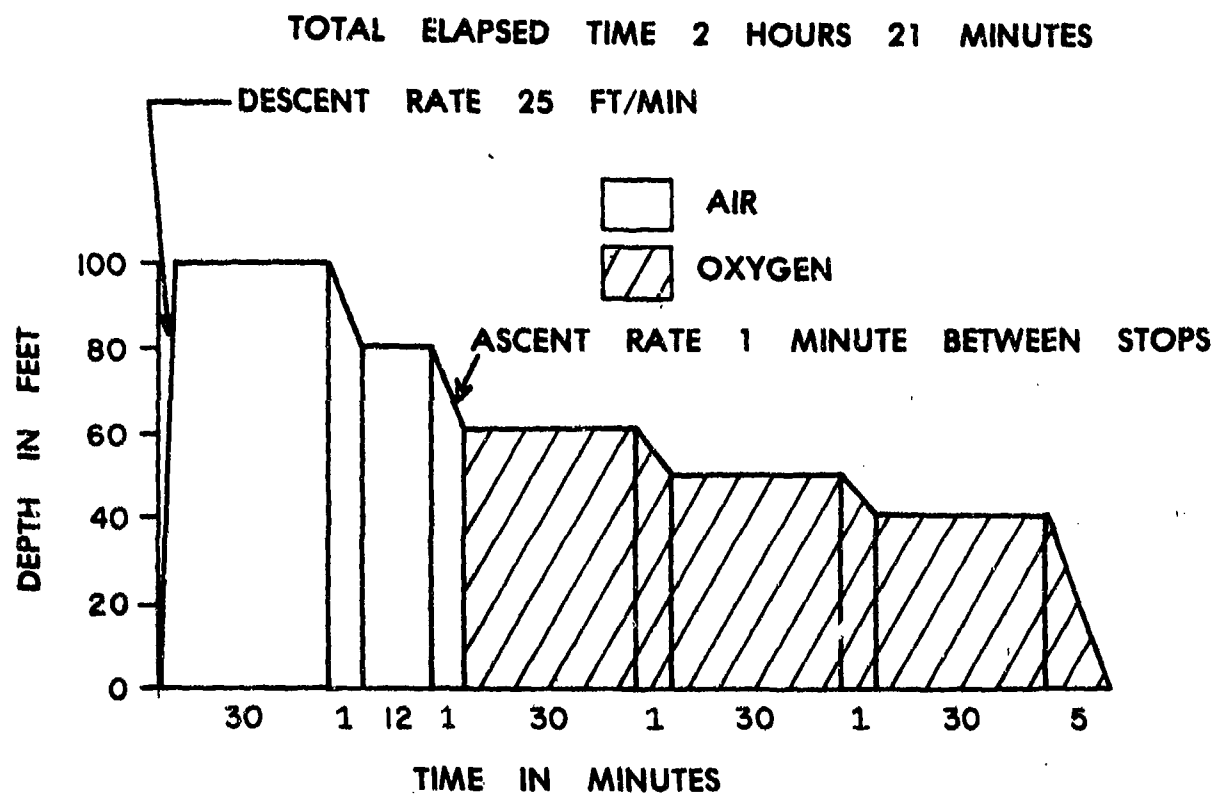


Figure 13

U.S. NAVY RECOMPRESSION TREATMENT TABLE 1A*
(AIR TREATMENT)

1. Use--treatment of pain-only decompression sickness when oxygen cannot be used and pain is relieved at a depth less than 66 feet.

2. Descent rate--25 ft/min.

3. Ascent rate--1 minute between stops.

4. Time at 100 feet--includes time from the surface.

*U.S. Navy Diving Manual (1958).

Depth (ft) (meters)		Time (min)	Breathing media	Total elapsed time (hours) (min)	
100	30	30	Air		30
80	24	12	Air		43
60	18	30	Air	1	14
50	15	30	Air	1	45
40	12	30	Air	2	16
30	9	60	Air	3	17
20	6	60	Air	4	18
10	3	120	Air	6	19
10-0	3-0	1	Air	6	20

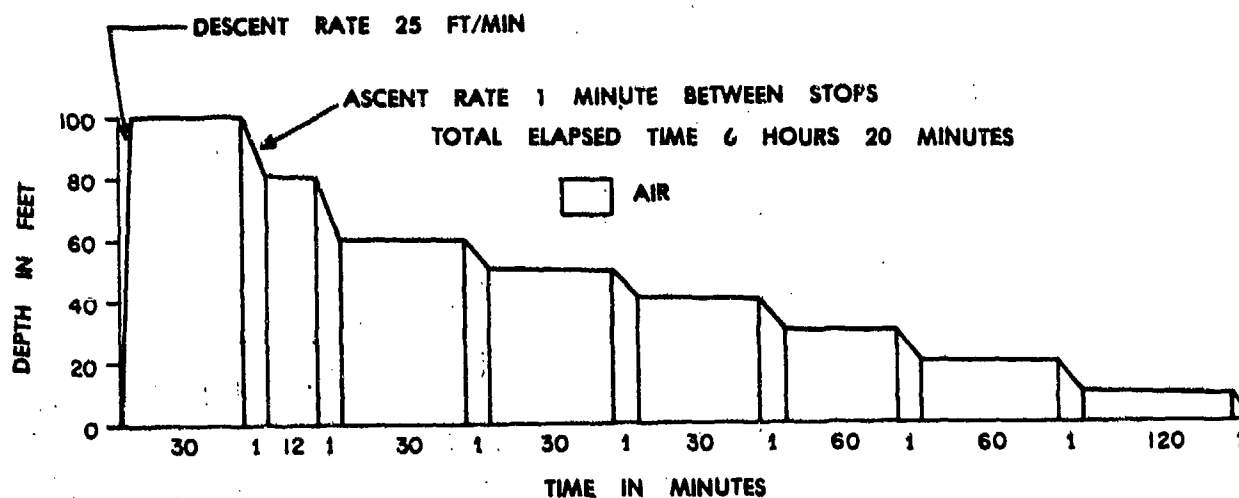


Figure 14

U.S. NAVY RECOMPRESSION TREATMENT TABLE 2*

1. Use--treatment of pain-only decompression sickness when oxygen is available and pain is relieved at a depth greater than 66 feet.

2. Descent rate--25 ft/min.

3. Ascent rate--1 minute between stops.

4. Time at 165 feet--includes time from the surface.

*U.S. Navy Diving Manual (1958).

Depth (ft) (meters)		Time (min)	Breathing media	Total elapsed time (hours) (min)	
165	50	30	Air		30
140	43	12	Air		43
120	37	12	Air		56
100	30	12	Air	1	9
80	24	12	Air	1	22
60	18	30	Oxygen	1	53
50	15	30	Oxygen	2	24
40	12	30	Oxygen	2	55
30	9	60	Oxygen	3	56
30-0	9-0	5	Oxygen	4	1

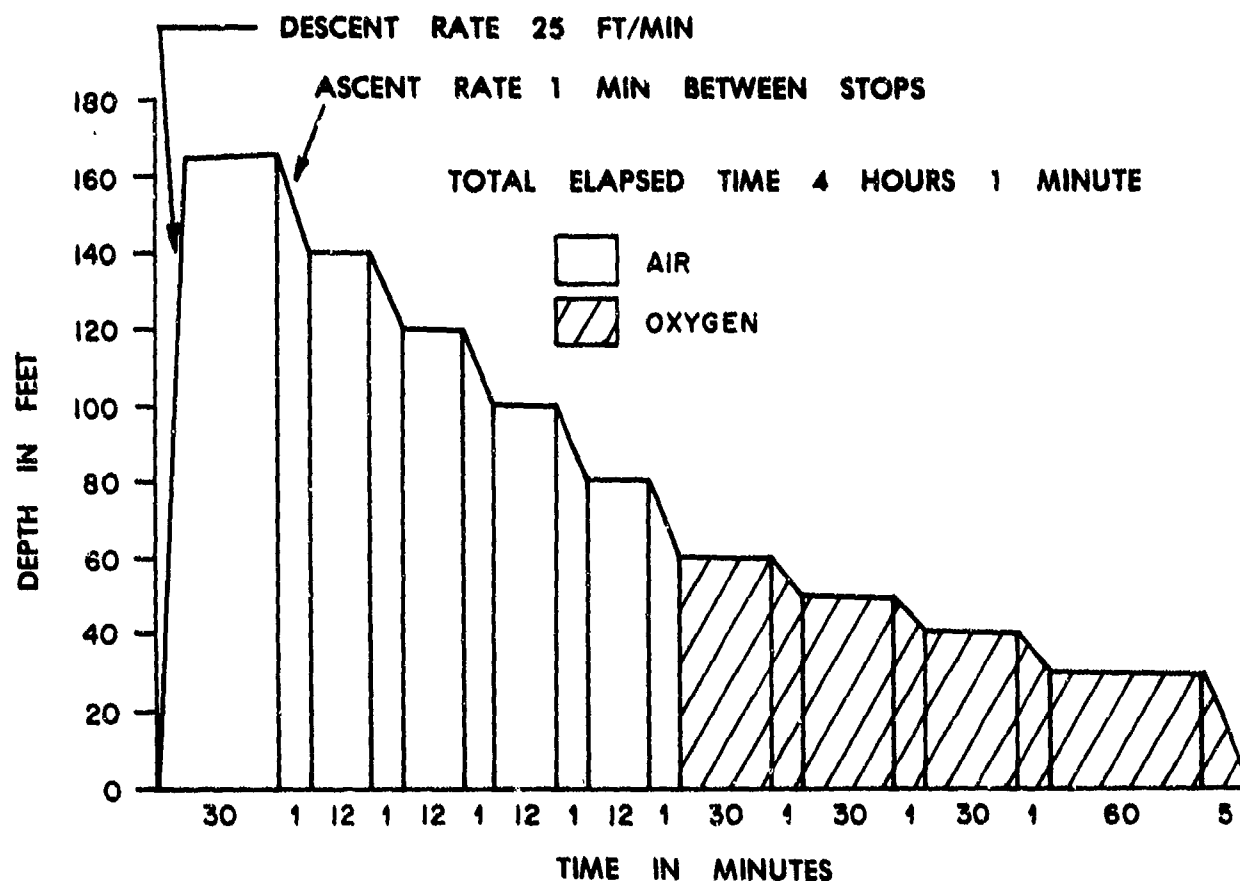


Figure 15

U.S. NAVY RECOMPRESSION TREATMENT TABLE 2A*
(AIR TREATMENT)

1. Use--treatment of pain-only decompression sickness when oxygen cannot be used and pain is relieved at a depth greater than 66 feet.
2. Descent rate--25 ft/min.
3. Ascent rate--1 mi between stops.
4. Time at 165 feet--includes time from the surface.

*U.S. Navy Diving Manual (1958).

Depth (ft) (meters)		Time (hours)(min)	Breathing media	Total elapsed time (hours)(min)
165	50	30	Air	30
140	43	12	Air	43
120	37	12	Air	56
100	30	12	Air	1 9
80	24	12	Air	1 22
60	18	30	Air	1 53
50	15	30	Air	2 24
40	12	30	Air	2 55
30	9	2	Air	4 56
20	6	2	Air	6 57
10	3	4	Air	10 58
10-0	3-0	1	Air	10 59

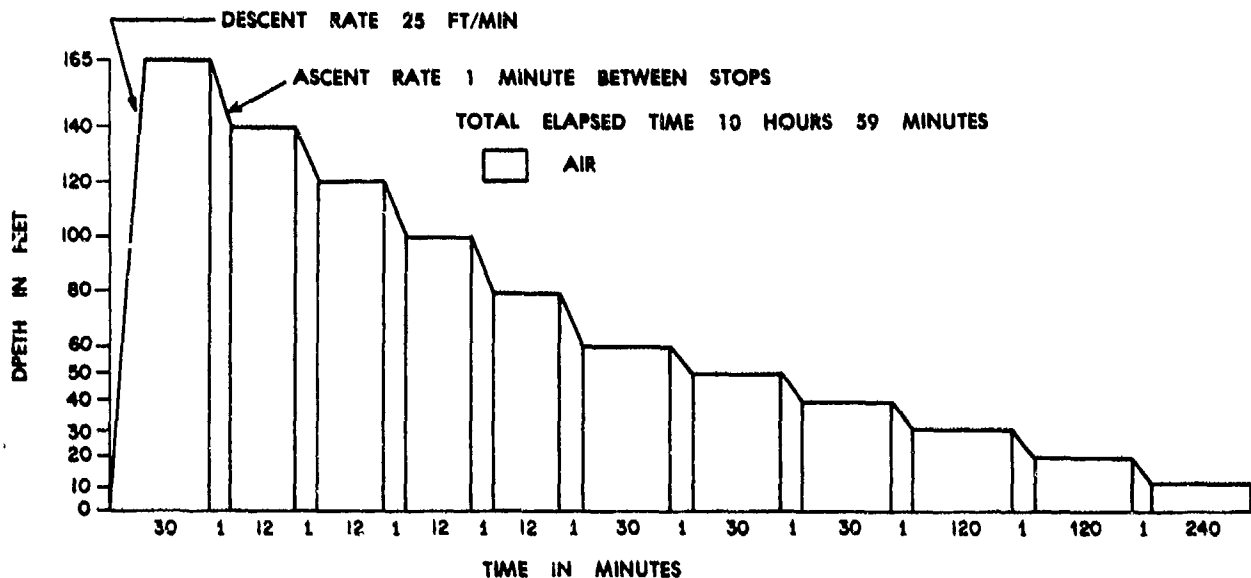


Figure 16

U.S. NAVY RECOMPRESSION TREATMENT TABLE 3*
(AIR TREATMENT)

1. Use--treatment of serious symptoms when oxygen cannot be used and symptoms are relieved within 30 minutes at 165 feet.
2. Descent rate--25 ft/min.
3. Ascent rate--1 minute between stops.
4. Time at 165 feet--includes time from surface.

*U.S. Navy Diving Manual (1958).

Depth (ft) (meters)		Time (hours)(min)	Breathing media	Total elapsed time (hours) (min)	
165	50	30	Air	30	
140	43	12	Air	43	
120	37	12	Air	56	
100	30	12	Air	1	9
80	24	12	Air	1	22
60	18	30	Oxygen (or air)	1	53
50	15	30	Oxygen (or air)	2	24
40	12	30	Oxygen (or air)	2	55
30	9	12	Air	14	56
20	6	2	Air	16	57
10	3	2	Air	18	58
10-0	3-0	1	Air	18	59

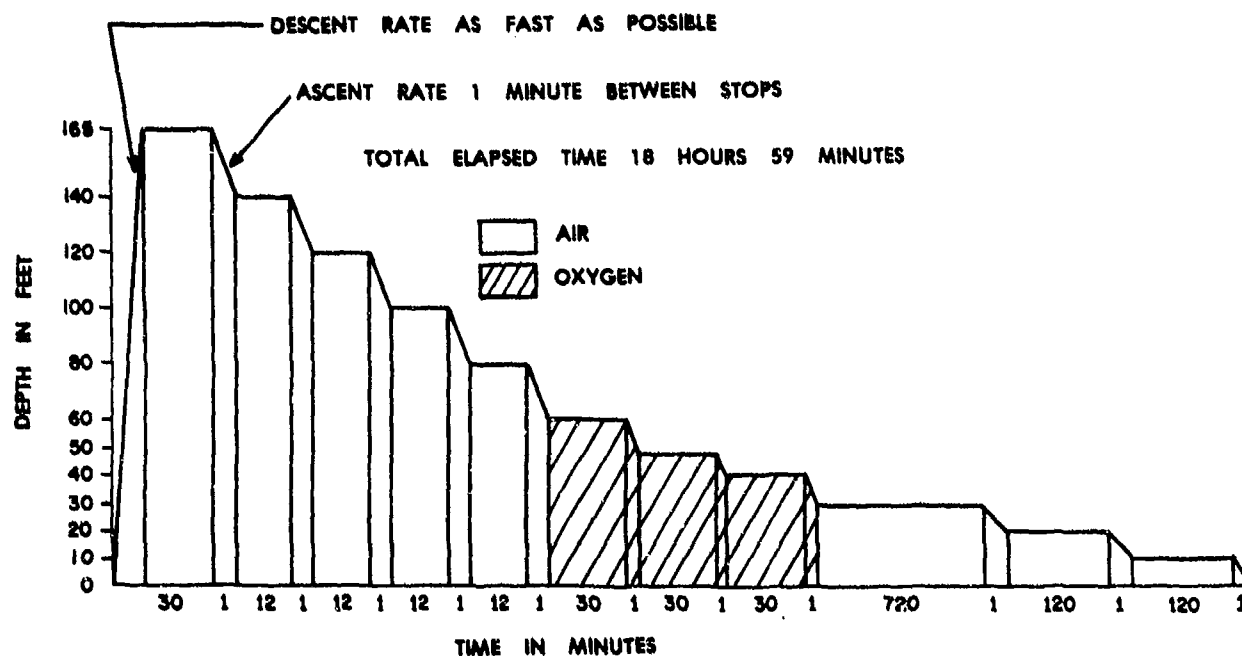


Figure 17

U.S. NAVY RECOMPRESSION TREATMENT TABLE 4*
(AIR TREATMENT)

1. Use--treatment of serious symptoms or gas embolism when oxygen cannot be used and when symptoms are not relieved within 30 minutes at 165 feet.
2. Descent rate--25 ft/min.
3. Ascent rate--1 minute between stops.
4. Time at 165 feet--includes time from the surface.

*U.S. Navy Diving Manual (1958).

Depth (ft) (meters)		Time (hours)(min)	Breathing media	Total elapsed time (hours)(min)	
165	50	30-90	Air	1	30
140	43	30	Air	2	1
120	37	30	Air	2	23
100	30	30	Air	3	3
80	24	30	Air	3	34
60	18	6	Air	9	35
50	15	6	Air	15	36
40	12	6	Air	21	37
30	9	11	Air	32	38
30	9	1	Oxygen (or air)	33	38
20	6	1	Air	34	39
20	6	1	Oxygen (or air)	35	39
10	3	1	Air	36	40
10	3	1	Oxygen (or air)	37	40
10-0	3-0	1	Oxygen	37	41

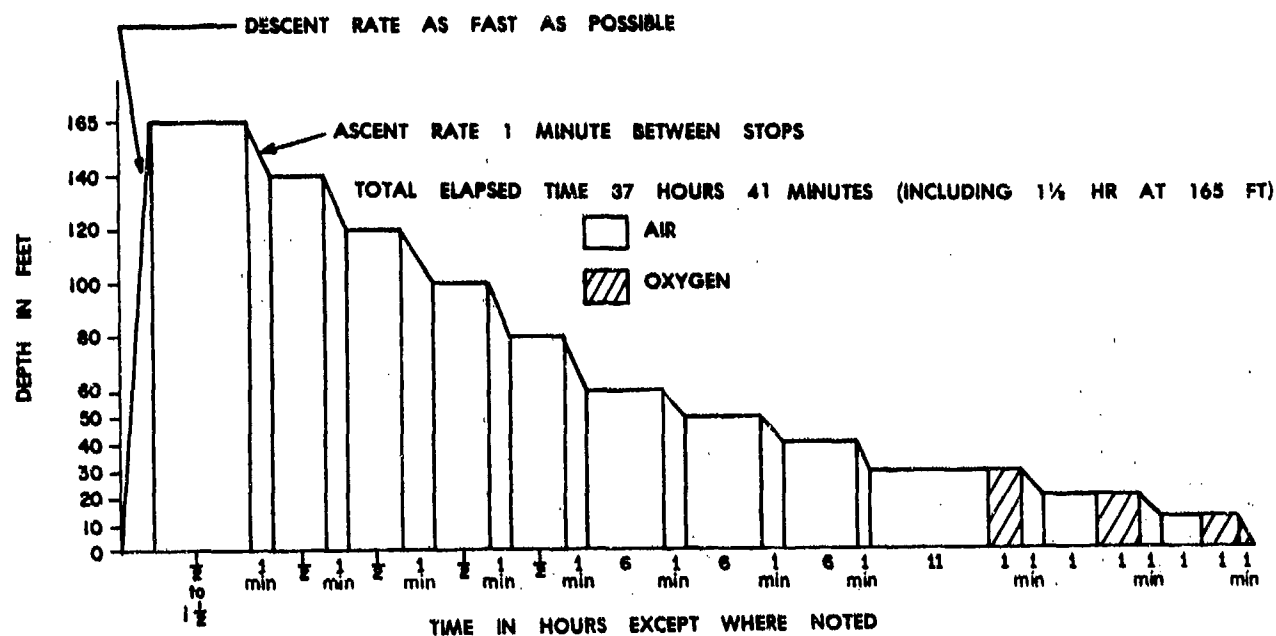


FIGURE 18

U.S. NAVY RECOMPRESSION TREATMENT TABLE 5 (OXYGEN TREATMENT)*

	Depth (ft) (meters)		Time (min)	Breathing media	Total elapsed time (hours) (min)	
1. Use--treatment of pain-only decompression sickness when oxygen can be used and symptoms are relieved within 10 minutes at 60 feet. Patient breathes oxygen from the surface.	60	18	20	Oxygen		20
2. Descent rate--25 ft/min.	60	18	5	Air		25
	60	18	20	Oxygen		45
3. Ascent rate--1 ft/min. Do not compensate for slower ascent rates. Compensate for faster rates by halting the ascent.	60-30	18-9	30	Oxygen	1	15
	30	9	5	Air	1	20
	30	9	20	Oxygen	1	40
	30	9	5	Air	1	45
4. Time at 60 feet--begins on arrival at 60 feet.	30-0	9-0	30	Oxygen	2	15
5. If oxygen breathing must be interrupted, allow 15 minutes after the reaction has entirely subsided and resume schedule at point of interruption.						
6. If oxygen breathing must be interrupted at 60 feet, switch to Table 6 upon arrival at the 30-foot stop.						
7. Tender breathes air throughout. If treatment is a repetitive dive for the tender or the table is lengthened, the tender should breath oxygen during the last 30 minutes of ascent to the surface.						

*U.S. Navy Diving Manual (1975).

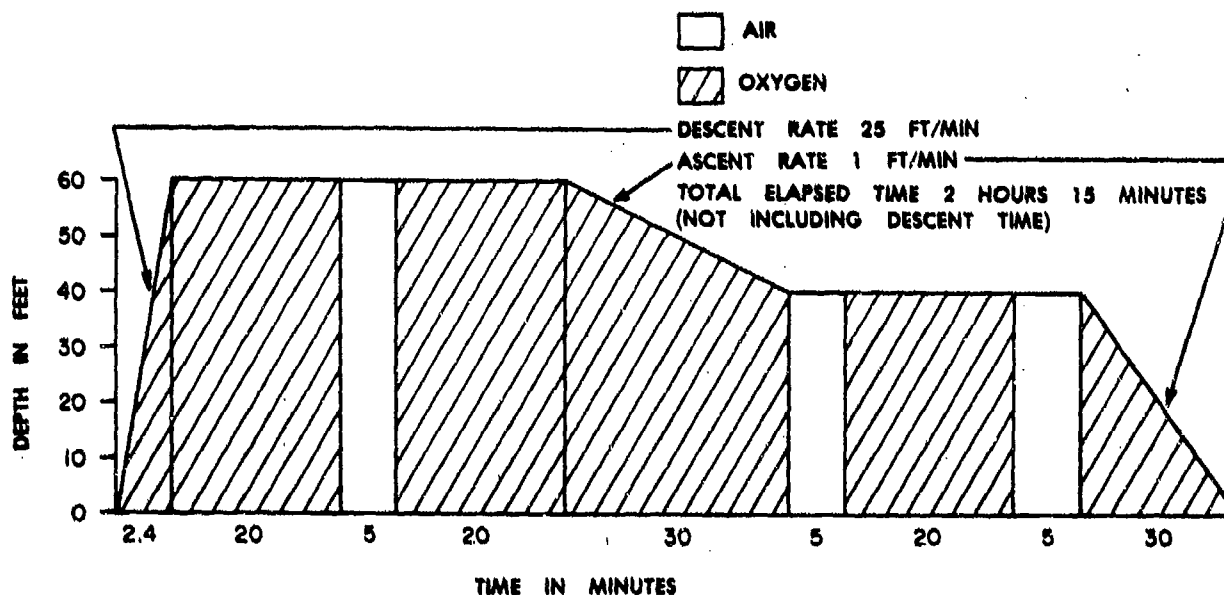


FIGURE 19

U.S. NAVY RECOMPRESSION TREATMENT TABLE 5A (OXYGEN TREATMENT)*

	Depth (ft) (meters)	Time (min)	Breathing media	Total elapsed time (hours)(min)
1. Use--treatment of gas embolism when oxygen can be used and symptoms are relieved within 15 minutes at 165 feet.				
2. Descent rate--as fast as possible.	165 50	15	Air	15
	165-60 50-18	4	Air	19
3. Ascent rate--1 ft/min. Do not compensate for slower ascent rates. Compensate for faster ascent rates by halting the ascent.	60 18	20	Oxygen	29
	60 18	5	Air	44
	60 18	20	Oxygen	1 4
	60-30 18-9	30	Oxygen	1 34
4. Time at 165 feet--includes time from the surface.	30 9	5	Air	1 39
	30 9	20	Oxygen	1 59
	30 9	5	Air	2 4
5. If oxygen breathing must be interrupted, allow 15 minutes after the reaction has entirely subsided and resume schedule at point of interruption.	30-0 9-0	30	Oxygen	2 34
6. Tender breathes air throughout. If treatment is a repetitive dive for the tender or the table is lengthened, the tender should breathe oxygen during the last 30 minutes of ascent to the surface.				

*U.S. Navy Diving Manual (1975).

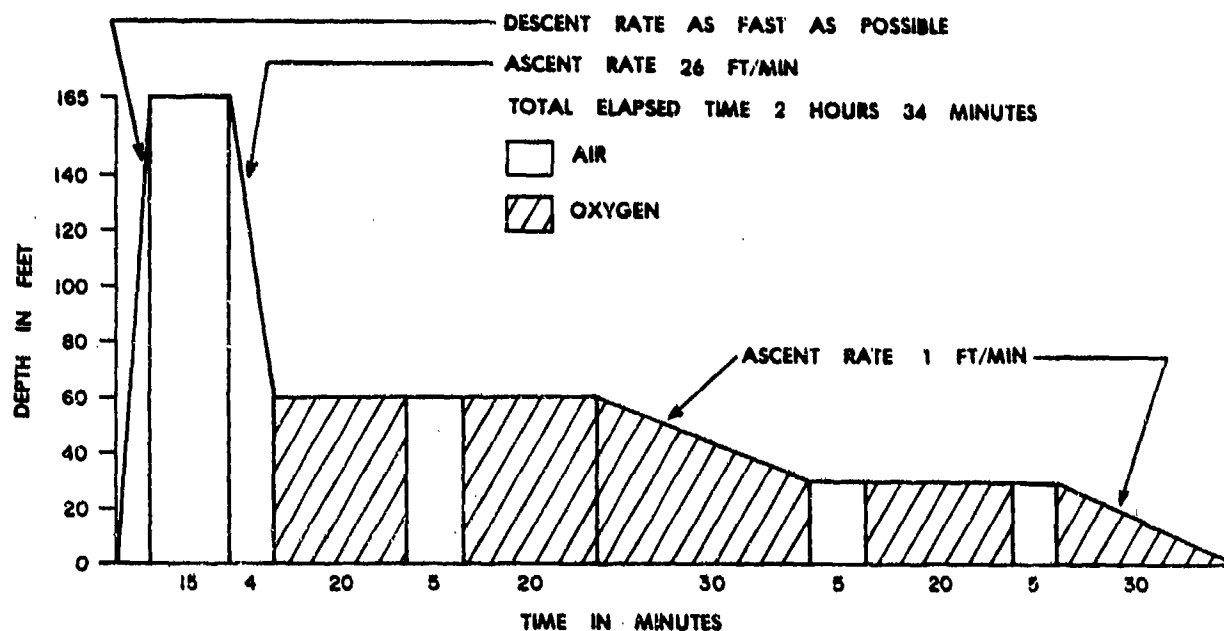


FIGURE 20

U.S. NAVY RECOMPRESSION TREATMENT TABLE 6 (OXYGEN TREATMENT)*

1. Use--treatment of decompression sickness when oxygen can be used and symptoms are not relieved within 10 minutes at 60 feet. Patient breathes oxygen from the surface.
2. Descent rate--25 ft/min.
3. Ascent rate--1 ft/min. Do not compensate for slower ascent rates. Compensate for faster rates by halting the ascent.
4. Time at 60 feet--begins on arrival at 60 feet.
5. If oxygen breathing must be interrupted, allow 15 minutes after the reaction has entirely subsided and resume schedule at point of interruption.
6. Tender breathes air throughout. If treatment is a repetitive dive for the tender or the table is lengthened, the tender should breathe oxygen during the last 30 minutes of ascent to the surface.

<u>Depth</u> <u>(ft) (meters)</u>		<u>Time</u> <u>(min)</u>	<u>Breathing</u> <u>media</u>	<u>Total</u> <u>elapsed time*</u> <u>(hours) (min)</u>	
60	18	20	Oxygen		20
60	18	5	Air		25
60	18	20	Oxygen		45
60	18	5	Air		50
60	18	20	Oxygen	1	70
60	18	5	Air	1	75
60-30	18-9	30	Oxygen	1	45
30	9	15	Air	2	0
30	9	60	Oxygen	3	0
30	9	15	Air	3	15
30	9	60	Oxygen	4	15
30-0	9-0	30	Oxygen	4	45

*Does not include descent time.

*U.S. Navy Diving Manual (1975).

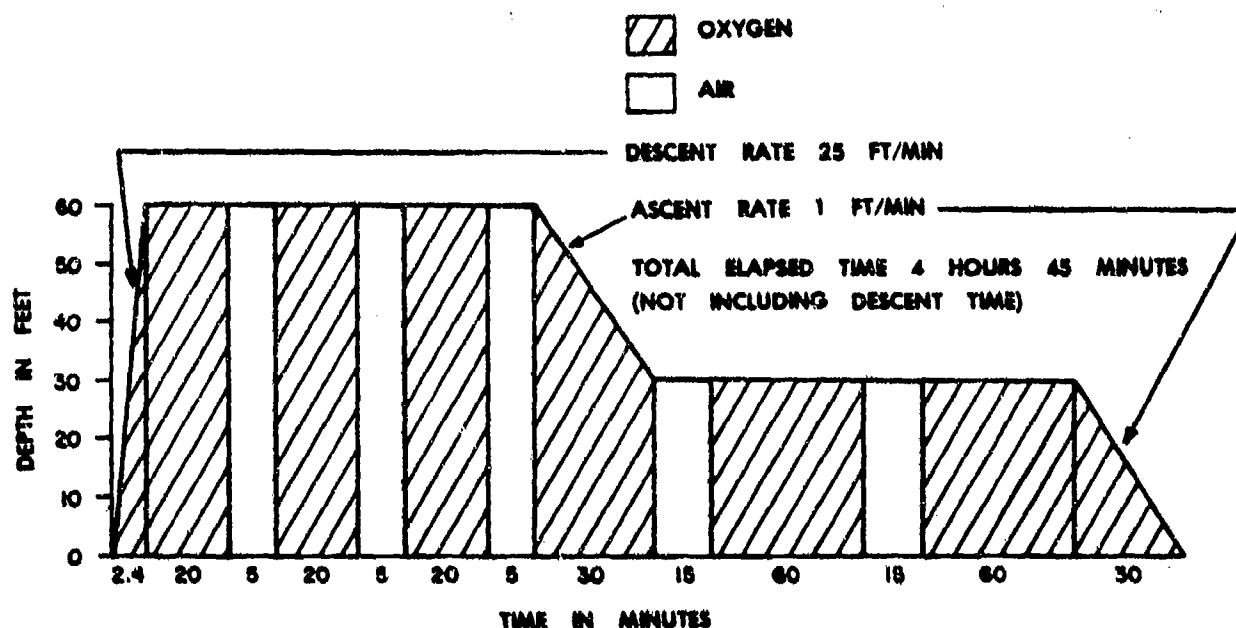


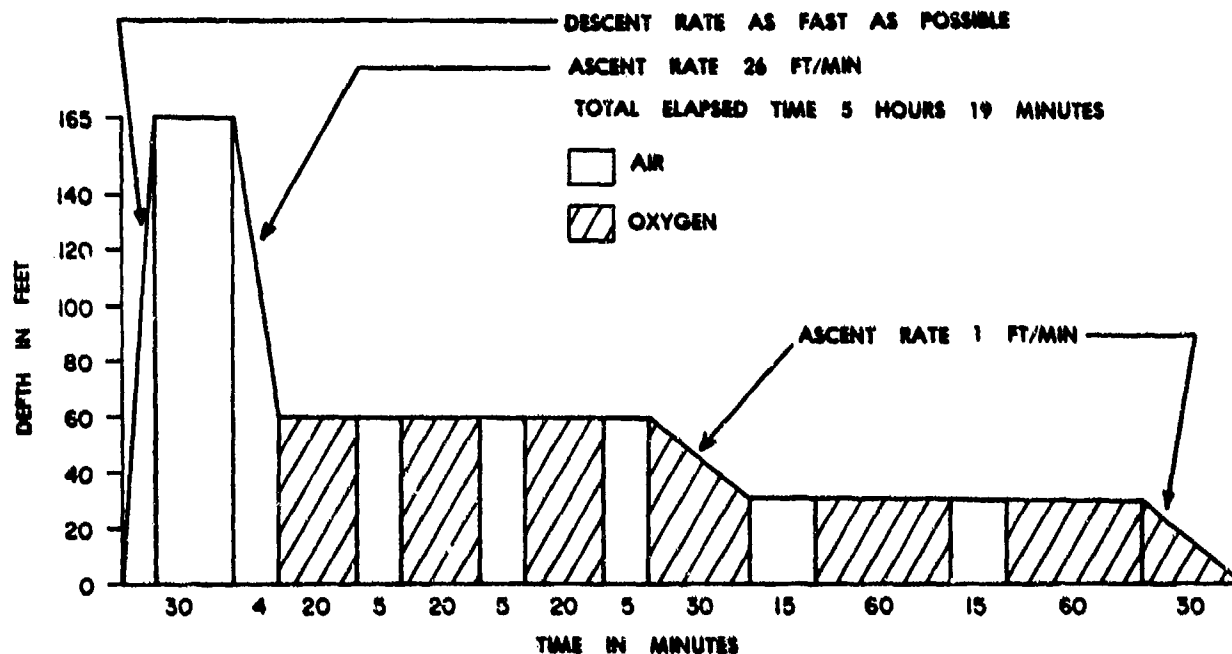
FIGURE 21

U.S. NAVY RECOMPRESSION TREATMENT TABLE 6A (OXYGEN TREATMENT)*

1. Use--treatment of gas embolism when oxygen can be used and symptoms moderate to a major extent within 30 minutes at 165 feet.
2. Descent rate--as fast as possible.
3. Ascent rate--1 ft/min. Do not compensate for slower ascent rates. Compensate for faster ascent rates by halting the ascent.
4. Time at 165 feet--includes time from the surface.
5. If oxygen breathing must be interrupted, allow 15 minutes after the reaction has entirely subsided and resume schedule at point of interruption.
6. Tender breathes air throughout. If treatment is a repetitive dive for the tender or the table is lengthened, the tender should breathe oxygen during the last 30 minutes of ascent to the surface.

Depth (ft) (meters)		Time (min)	Breathing media	Total elapsed time (hours) (min)	
165	50	30	Air		30
165-60	50-18	4	Air		34
60	18	20	Oxygen		54
60	18	5	Air		59
60	18	20	Oxygen	1	19
60	18	5	Air	1	24
60	18	20	Oxygen	1	44
60	18	5	Air	1	49
60-30	18-9	30	Oxygen	2	19
30	9	15	Air	2	34
30	9	60	Oxygen	3	34
30	9	15	Air	3	49
30	9	60	Oxygen	4	49
30-0	9-0	30	Oxygen	5	19

*U.S. Navy Diving Manual (1975).



U.S. NAVY TREATMENT PROCEDURE FOR DECOMPRESSION SICKNESS
OCCURRING ON SATURATION DIVES*

1. Use--for treatment of decompression sickness manifested as musculoskeletal pain only.
2. Procedure--recompress in increments of 10 feet at 5 ft/min until distinct improvement is indicated by the diver. Recompression more than 30 feet is usually not necessary and causes increasing pain in some cases.
3. During recompression and at treatment depth, a treatment mixture may be given by mask to provide an oxygen partial pressure of 1.5 to 2.5 atm. Pure oxygen may be used at treatment depths of 60 feet or less. Interrupt the mask treatment every 20 minutes with 5 minutes of breathing the chamber atmosphere.
4. Treat serious decompression sickness that results from an excursion ascent by immediate recompression at 30 ft/min to at least the depth from which the excursion ascent originated. If there is not complete relief at that depth, recompression should continue deeper until relief is accomplished.
5. Remain at the treatment depth a minimum of 12 hours in serious decompression sickness and a minimum of 2 hours in pain-only decompression sickness. Resume the standard saturation decompression schedule from the treatment depth.

Standard Saturation Depth (ft)	Decompression Rate (ft/hour)
1600-200	6
200-100	5
100-50	4
50-0	3

*U.S. Navy Diving Manual (1975).

**TEKTITE I and II TREATMENT AND EMERGENCY DECOMPRESSION
SCHEDULE FOR A 42- TO 50-FOOT SATURATION DIVE***

1. Use--for treatment of any of the TEKTITE aquanauts who might develop decompression sickness due to emergency surfacing. Saturation gas mixture was 9% O₂-91% N₂.
2. Descent rate--as fast as the patient and tenders can tolerate.
3. Ascent rate--1 min/ft on the same gas as breathed at the previous stop.
4. Time at 60 feet is independent of the compression time.

*Beckman and Smith (1972).

Depth		Time		Breathing media	Total elapsed time	
(ft)	(meters)	(hours)	(min)		(hours)	(min)
60	18		20	Oxygen		20
55	17		20	Air		45
50	15		20	Oxygen	1	10
45	14		20	Air	1	35
40	14		20	Oxygen	2	0
25	8	1		Air	3	15
20	6	1	30	Air	4	50
20	6		30	Oxygen	5	20
15	5	1	30	Air	6	55
15	5	1		Oxygen	7	55
10	3	2		Air	10	0
10	3	1		Oxygen	11	0
5	2	2	30	Air	13	35
5	2	1		Oxygen	14	35
5-0	2-0		5	Air	14	40

Total 100% Oxygen Inhalation = 4 hours 50 minutes

**TEKTITE II TREATMENT AND EMERGENCY DECOMPRESSION SCHEDULE
FOR THE 100-FOOT SATURATION DIVE***

1. Use--for treatment of individuals who might develop decompression sickness due to emergency surfacing.
2. Descent rate--as fast as the patient and tenders can tolerate.

*Beckman and Smith (1972).

Procedure

1. Recompress diver to 165 ft in the Deck Decompression Chamber immediately in an air-breathing atmosphere.
2. If full recovery or stabilization occurs within 15 minutes, proceed to Step 5 herein.
3. If diver's condition does not stabilize or if it continues on a downhill course, further recompress him to 200 ft and change breathing mixture to 90% He-10% O₂. If stabilization or recovery results from this procedure, proceed to Step 5.
4. If procedures of Step 3 are unavailing in producing stabilization or recovery of the diver, further recompress him to 250 ft and maintain 90% He-10% O₂ breathing mixture.
5. Keep diver 24 hours at the pressure treatment that halted or reversed symptoms. Adjust O₂ percentage to normoxic value within 4 hours.
6. Decompress diver to 70 ft at the rate of 24 min/ft. Maintain the normoxic breathing mixture.
7. Follow regular 100-ft decompression schedule from 70 ft to surface pressure. Switch to air breathing if diver was breathing N₂-O₂ previously. Otherwise, he must remain on the normoxic He-O₂ mixture interspersed with periods of breathing 100% O₂ as prescribed in Figure 22.

FIGURE 25

ROYAL NAVY 1943 RECOMPRESSION TREATMENT PROCEDURE*

1. Use--Treatment of any decompression sickness symptoms. For pain-only symptoms, compress to the depth of relief. For cases involving paralysis and other CNS involvement, compress to the highest pressure available. Start the decompression according to the following schedule when relief is obtained or after 1 hour, whichever comes first.

Depth (ft) (meters)	Time (hours)(min)	Rate (ft/min)	Breathing media	Total elapsed time (hours)(min)
225-202 68-61	2.5	9.0	Air	11.5
202-169 61-51	7.5	4.5	Air	19.0
169-135 51-41	15.0	2.3	Air	34.0
135-101 41-31	22.5	1.5	Air	56.5
101-67 31-20	45.0	.75	Air	1 41.5
67-34 20-10	1 15.0	.45	Air	2 56.5
34-0 10-0	2	.28	Air	4 56.5

2. Descent rate--8 meters (m) per minute (25 ft/min).

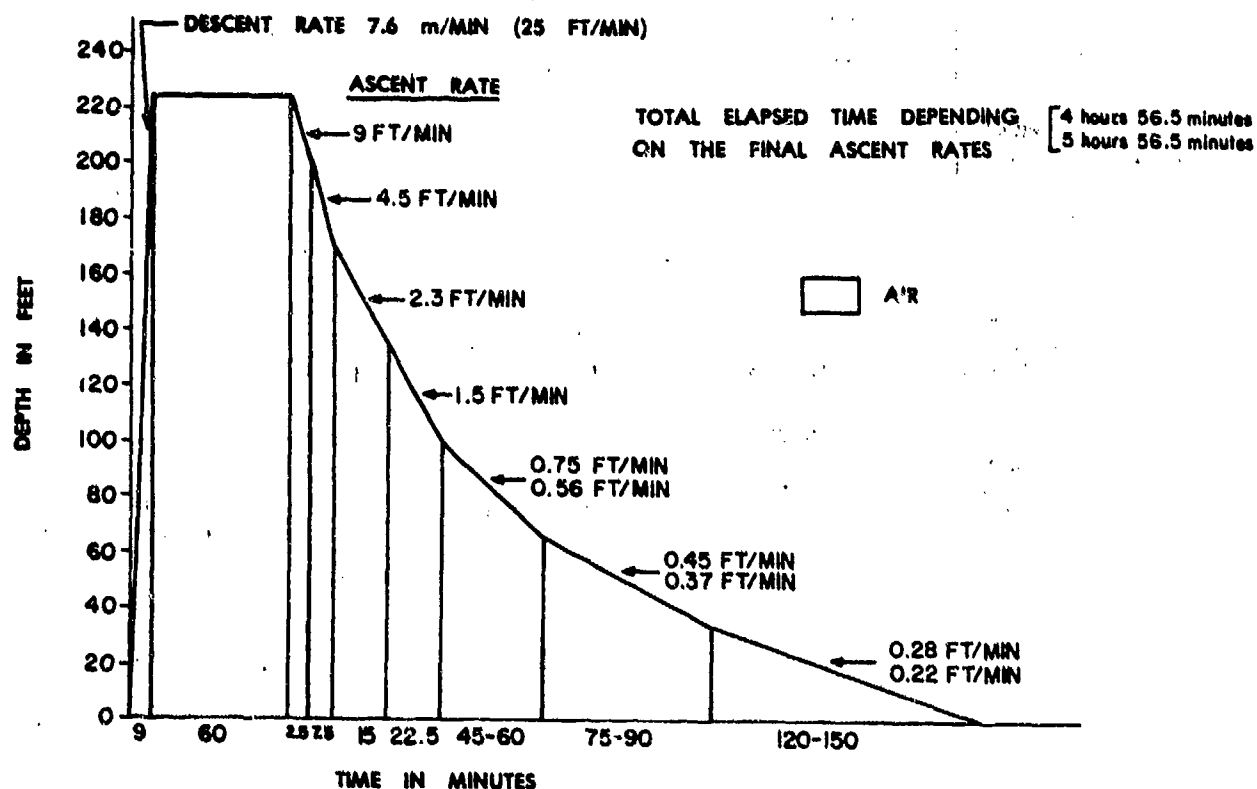
In the event of persistent symptoms increase the last three travel times:

3. Ascent rate--see table provided.

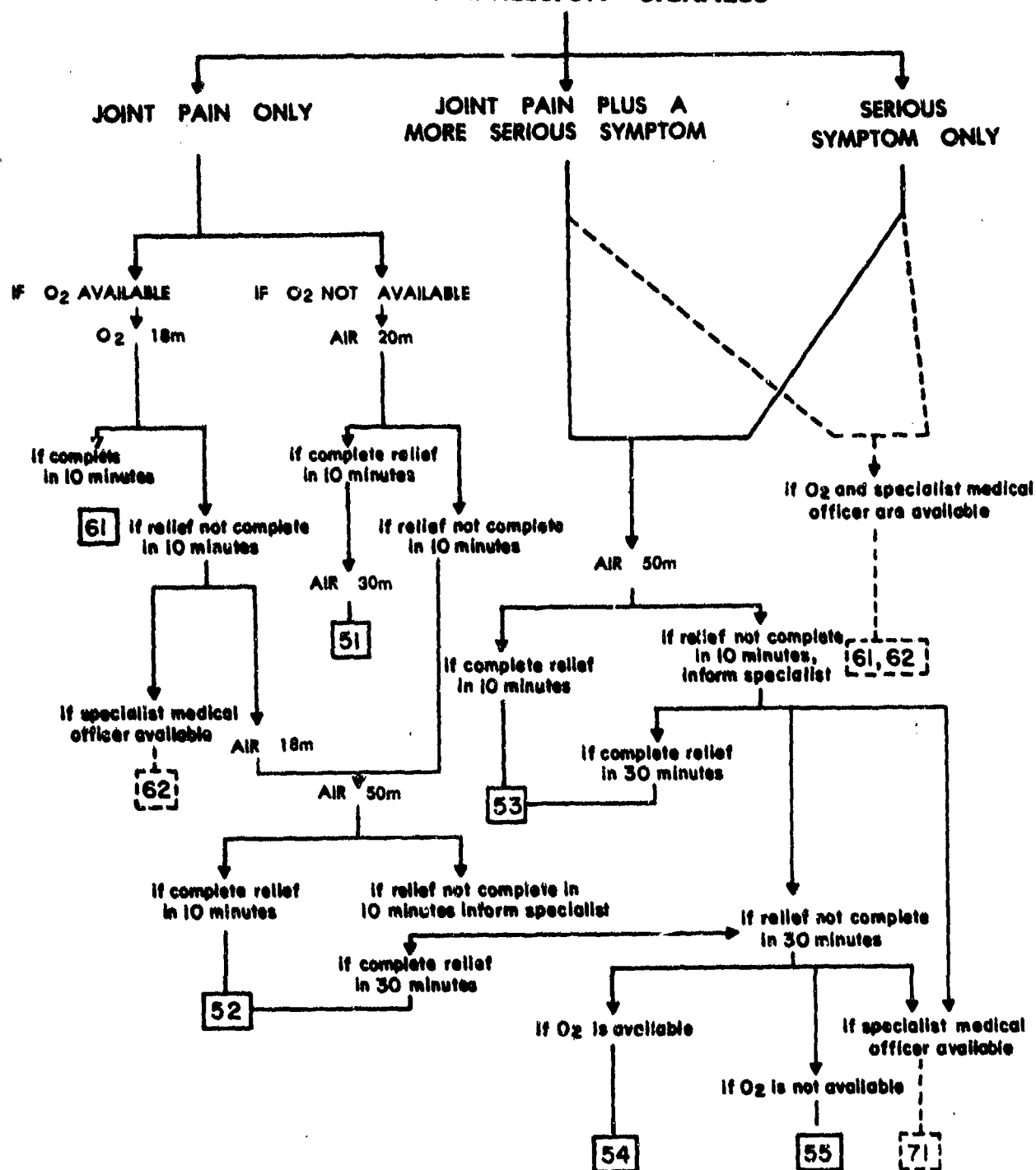
101-67 31-20	1	.56	Air	1 56.5
67-34 20-10	1 30	.37	Air	3 26.5
34-0 10-0	2 30	.22	Air	5 56.5

4. Time at maximum treatment pressure does not include compression time.

*Source unknown.



DECOMPRESSION SICKNESS *



* FIG. 5511. DECOMPRESSION CHART * From: Ministry of Defense (Royal Navy) Diving Manual (1972).

□ British Recompression Treatment Table To Be Used.

FIGURE 27

ROYAL NAVY TABLE 51--AIR RECOMPRESSION THERAPY*

1. Use--treatment of pain-only decompression sickness when oxygen is not available and when pain is relieved within 10 minutes at or less than a depth of 20 meters (66 ft).
2. Descent rate--at a rate of approximately 10 m/min (33 ft/min).
3. Ascent rate--5 minutes between stops.
4. Time at 30 meters (98 ft) does not include the compression time or the time at 20 meters (66 ft).

Depth (ft) (meters)		Time (hours)(min)		Breathing media	Total elapsed time (hours)(min)	
66	20		10	Air		12
98	30		30	Air		43
79	24		12	Air	1	0
59	18		30	Air	1	35
49	15		30	Air	2	10
39	12		30	Air	2	45
29	9	1		Air	3	50
20	6	1		Air	4	55
10	3	2		Air	7	0
10-0	3-0		5	Air	7	5

*Royal Navy Diving Manual (1972).

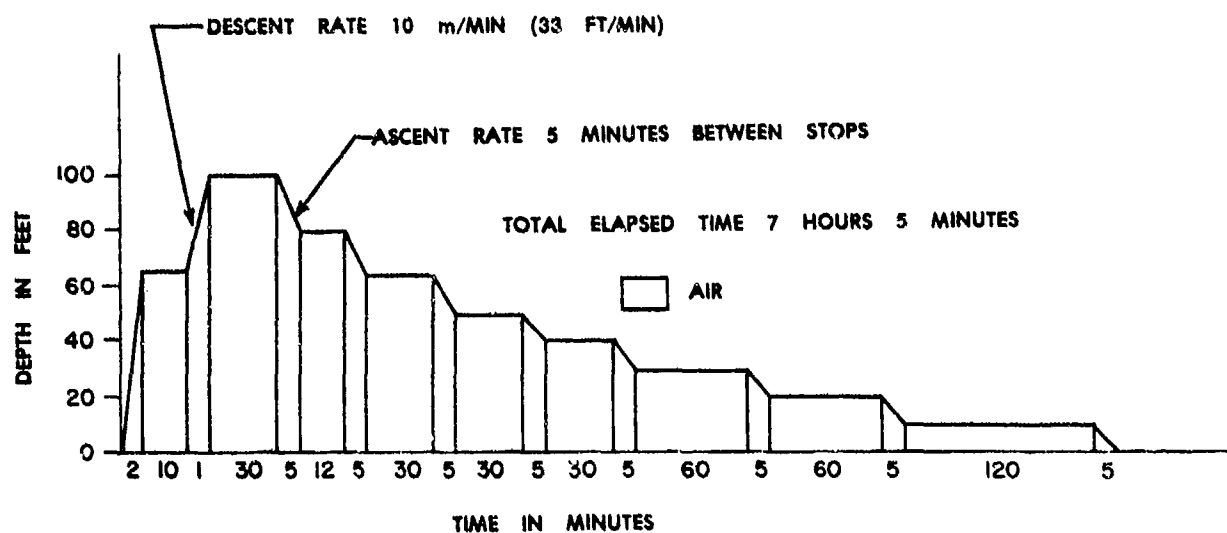


FIGURE 28

ROYAL NAVY TABLE 52--AIR RECOMPRESSION THERAPY*

1. Use--treatment of pain-only decompression sickness when oxygen is not available and pain is not relieved with 10 minutes at or less than 20 meters (66 ft), but does have relief within 10 minutes at 50 meters (164 ft).
2. Descent rate--at a rate of approximately 10 m/min (33 ft/min).
3. Ascent rate--5 minutes between stops.
4. Time at 50 meters (164 ft) does not include the compression time or the time at 20 m (66 ft).

*Royal Navy Diving Manual (1972).

Depth (ft) (meters)		Time (hours)(min)		Breathing media	Total elapsed time (hours)(min)	
66	20	10		Air		12
164	50	30		Air		45
138	42	12		Air	1	2
118	36	12		Air	1	19
98	30	12		Air	1	36
79	24	12		Air	1	53
59	18	30		Air	2	28
49	15	30		Air	3	3
39	12	30		Air	3	38
30	9	2		Air	5	43
20	6	2		Air	7	48
10	3	2		Air	9	53
10-0	3-0	5		Air	9	58

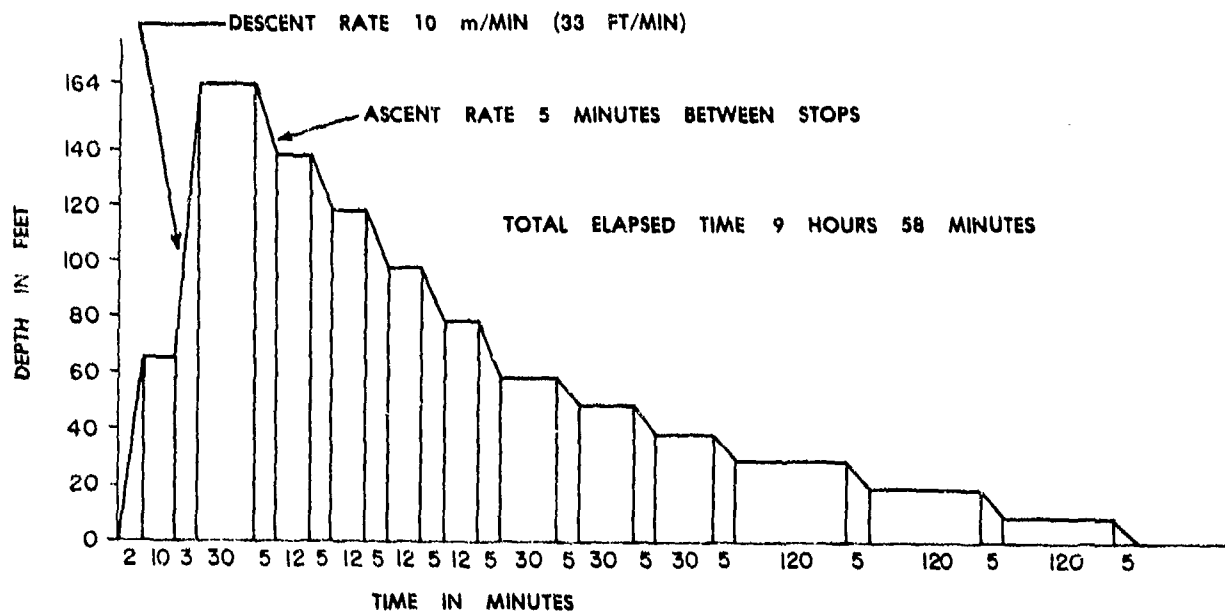


FIGURE 29

ROYAL NAVY TABLE 53--AIR RECOMPRESSION THERAPY*

1. Use--treatment of joint pain plus a more serious symptom of decompression sickness when oxygen is not available and symptoms are relieved within 30 minutes at or less than 50 meters (164 ft).
2. Descent rate--(a) in mild cases, at a rate of approximately 10 m/min; (b) in serious cases as fast as can be tolerated by the patient.
3. Ascent rate--5 minutes between stops.
4. Time at 50 meters (164 ft) does not include the compression time.

Royal Navy Diving Manual (1972).

Depth (ft) (meters)		Time (hours)(min)		Breathing media	Total elapsed time (hours) (min)	
164	50	30		Air		35
138	42	12		Air		52
118	36	12		Air	1	9
98	30	12		Air	1	26
79	24	12		Air	1	43
59	18	30		Air	2	18
49	15	30		Air	2	53
39	12	30		Air	3	28
30	9	12		Air	15	33
20	6	2		Air	17	38
10	3	2		Air	19	43
10-0	3-0	5			19	48

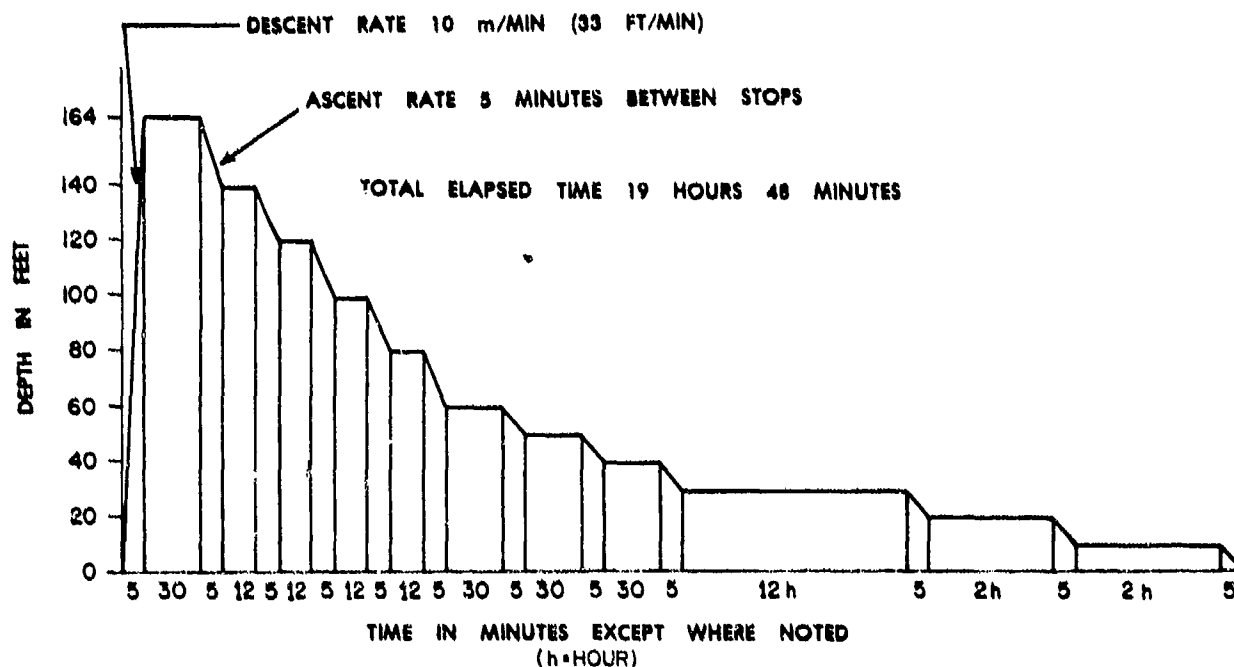


FIGURE 30

ROYAL NAVY TABLE 54--AIR RECOMPRESSION THERAPY*

1. Use--treatment of joint pain plus a more serious symptom of decompression sickness when oxygen is available and symptoms are not relieved within 30 minutes at or less than 50 meters (164 ft).
2. Descent rate--(a) in mild cases, compress at a rate of approximately 10 m/min; (b) in serious cases, compress as fast as can be tolerated by the patient.
3. Ascent rate--5 minutes between stops.
4. Time at 50 meters (164 ft) does not include the compression time.

*Royal Navy Diving Manual (1972).

Depth (ft) (meters)		Time (hours)(min)		Breathing media	Total elapsed time (hours)(min)	
164	50	2		Air	2	5
138	42		30	Air	2	40
118	36		30	Air	3	15
98	30		30	Air	3	50
79	24		30	Air	4	25
59	18	6		Air	10	30
49	15	6		Air	16	35
39	12	6		Air	22	40
30	9	11		Air	33	45
30	9	1		Oxygen	34	45
20	6	1		Air	35	50
20	6	1		Oxygen	36	50
10	3	1		Air	37	55
10	3	1		Oxygen	38	55
10-0	3-0		5	Oxygen	39	0

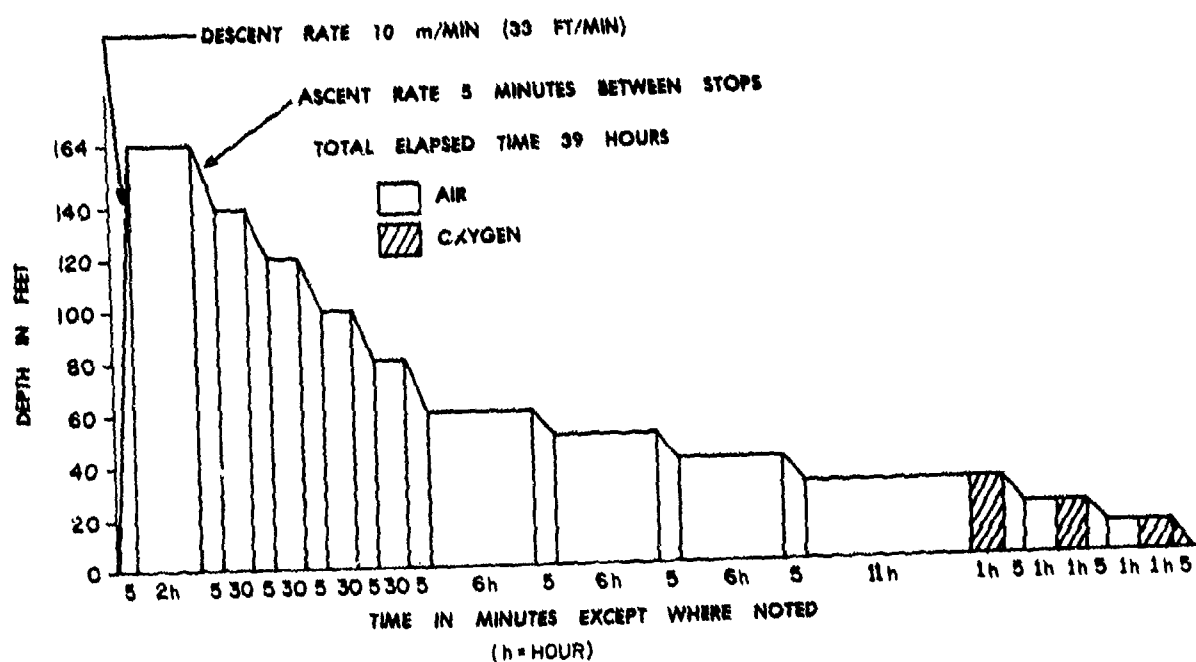


FIGURE 31

ROYAL NAVY TABLE 55--AIR RECOMPRESSION THERAPY*

1. Use--treatment of joint pain plus a more serious symptom of decompression sickness when oxygen is not available and the symptoms are not relieved within 30 minutes at or less than 50 meters (164 ft).
2. Descent rate--(a) in mild cases, compress at a rate of approximately 10 m/min; (b) in serious cases, compress as fast as can be tolerated by the patient.
3. Ascent rate--5 minutes between stops.
4. Time at 50 meters does not include the compression time.

Depth		Time		Breathing media	Total elapsed time	
(ft)	(meters)	(hours)	(min)		(hours)	(min)
164	50	2		Air	2	5
138	42		30	Air	2	40
118	36		30	Air	3	15
98	30		30	Air	3	50
79	24		30	Air	4	25
59	18	6		Air	10	30
49	15	6		Air	16	35
39	12	6		Air	22	40
30	9	12		Air	34	45
20	6	4		Air	38	50
10	3	4		Air	42	55
10-0	3-0		5	Air	43	0

*Royal Navy Diving Manual (1972).

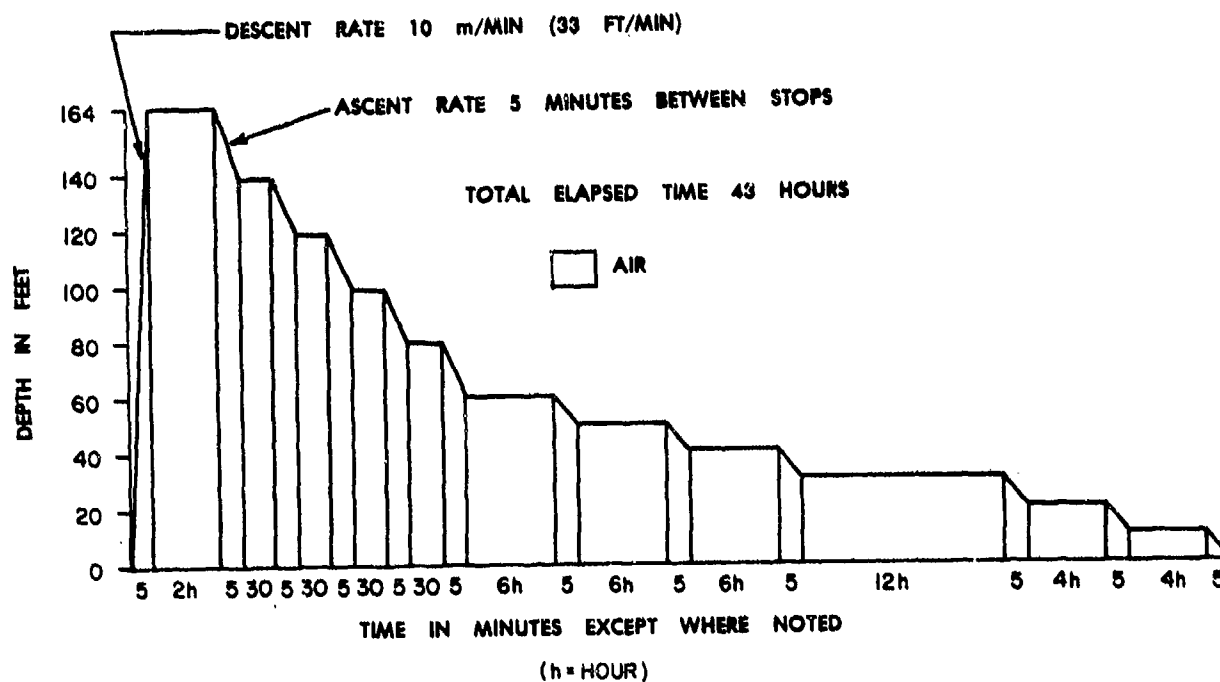


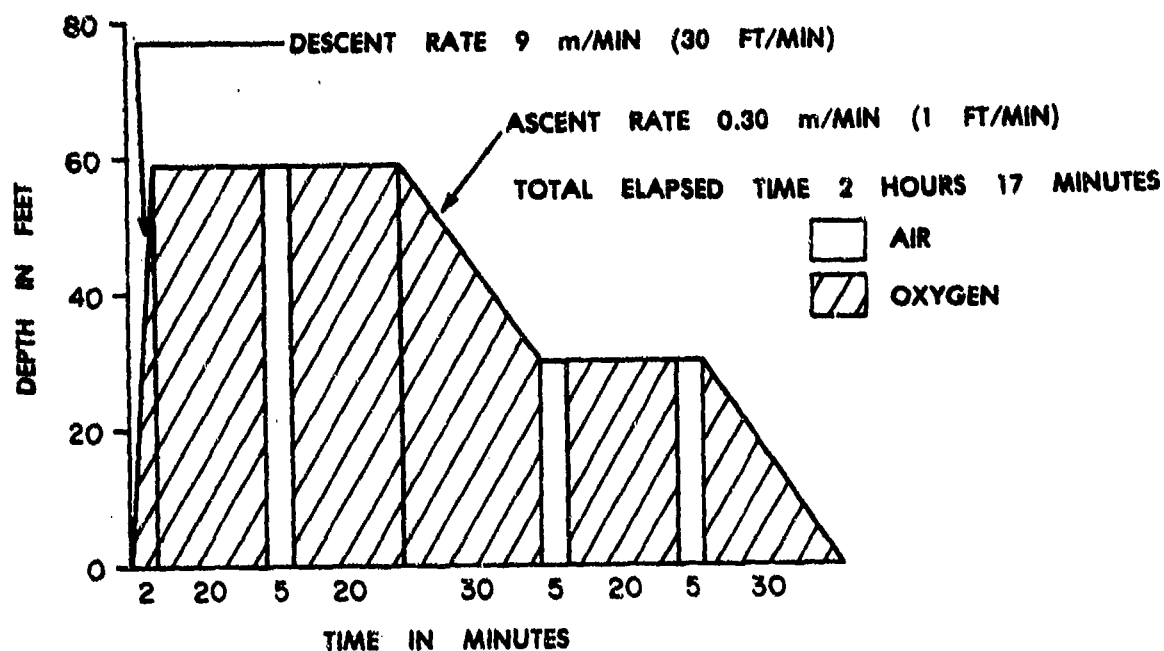
FIGURE 32

ROYAL NAVY TABLE 61--OXYGEN RECOMPRESSION THERAPY*

1. Use--treatment of pain-only decompression sickness when oxygen is available and pain is relieved within 10 minutes or at less than 18 meters (59 ft), or for serious symptoms when a specialized medical officer is present.
2. Descent rate--compress to 18 meters in 1 or 2 minutes with the patient breathing oxygen.
3. Ascent rate--decompress between stops on oxygen at the rate of 0.30 m/min (0.98 ft/min).
4. Time at 18 meters does not include the compression time.

Depth (ft) (meters)		Time (min)	Breathing media	Total elapsed time (hours)(min)	
59	18	20	Oxygen		22
59	18	5	Air		27
59	18	20	Oxygen		47
59-30	18-9	30	Oxygen	1	17
30	9	5	Air	1	22
30	9	20	Oxygen	1	42
30	9	5	Air	1	47
30-0	9-0	30	Oxygen	2	17

*Royal Navy Diving Manual (1972).



ROYAL NAVY TABLE 62--OXYGEN RECOMPRESSION THERAPY*

1. Use--treatment of pain-only decompression sickness when oxygen is available and pain is not relieved within 10 minutes at 18 meters (59 ft) or for serious symptoms when a specialized medical officer is present.
2. Descent rate--compress to 18 meters in 1 or 2 minutes with the patient breathing oxygen.
3. Ascent rate--decompress between stops on oxygen at the rate of 0.30 m/min (0.98 ft/min).
4. Time at 18 meters does not include the compression time.

Depth (ft) (meters)		Time (min)	Breathing media	Total elapsed time (hours)(min)	
59	18	20	Oxygen		22
59	18	5	Air		27
59	18	20	Oxygen		47
59	18	5	Air		52
59	18	20	Oxygen	1	12
59	18	5	Air	1	17
59-30	18-9	30	Oxygen	1	47
30	9	15	Air	2	2
30	9	60	Oxygen	3	2
30	9	15	Air	3	17
30	9	60	Oxygen	4	17
30-0	9-0	30	Oxygen	4	47

*Royal Navy Diving Manual (1972).

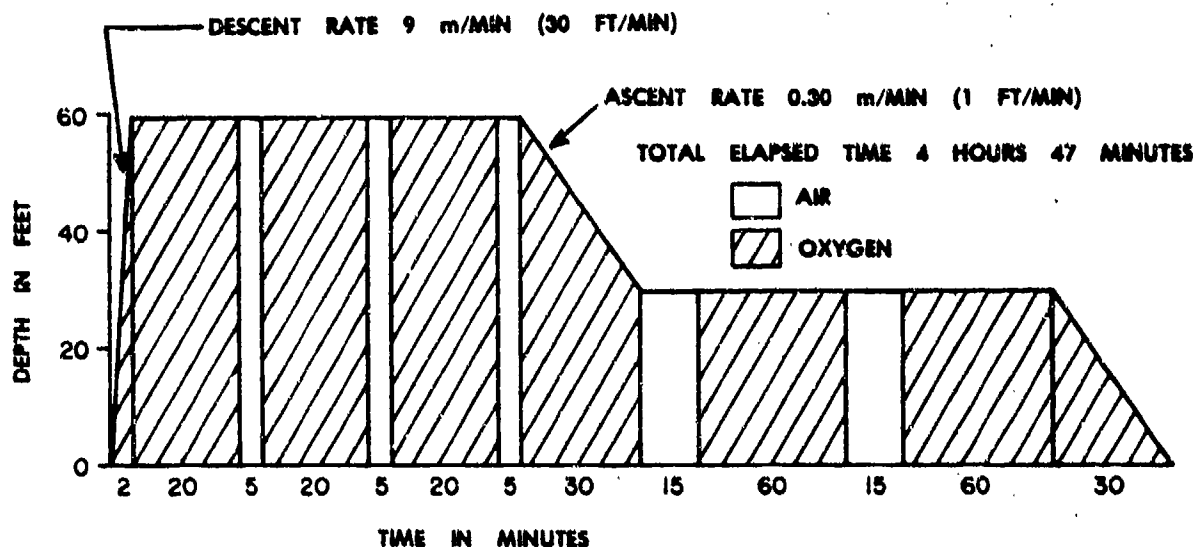


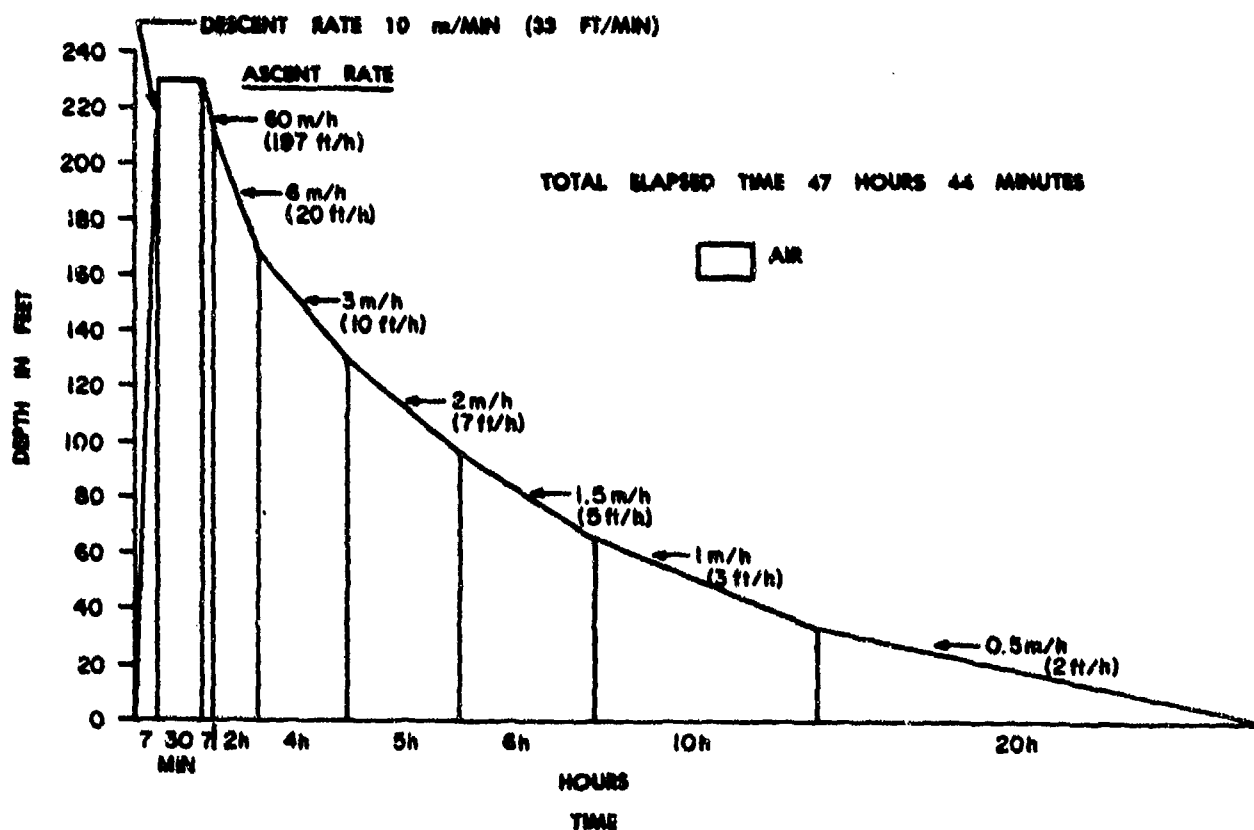
FIGURE 34

ROYAL NAVY TABLE 71--MODIFIED AIR
RECOMPRESSION TABLE*

1. Use--treatment of any decompression symptom in lieu of the air recompression therapy if a specialist medical officer is present.
2. Descent rate--10 m/min (33 ft/min).
3. Ascent rate--continuous bleed at the rates shown below.
4. Time at the maximum pressure does not include the compression time.
5. Maximum pressure--may be less than that shown in the table below; it depends on the working pressure of available chamber.
6. Oxygen--may be administered periodically to selected cases as advised by the medical officer.

Depth (ft) (meters)	Time (hours)(min)	Rate meters/hours	Breathing media	Total elapsed time (hours)(min)
230 70	30 7	--	Air	37
230-207 70-63		60	Air	44
207-167 63-51	2	6	Air	2 44
167-128 51-39	4	3	Air	6 44
128-95 39-29	5	2	Air	11 44
95-66 29-20	6	1.5	Air	17 44
66-33 20-10	10	1	Air	27 44
33-0 10-0	20	0.5	Air	47 44

*Royal Navy Diving Manual (1972).



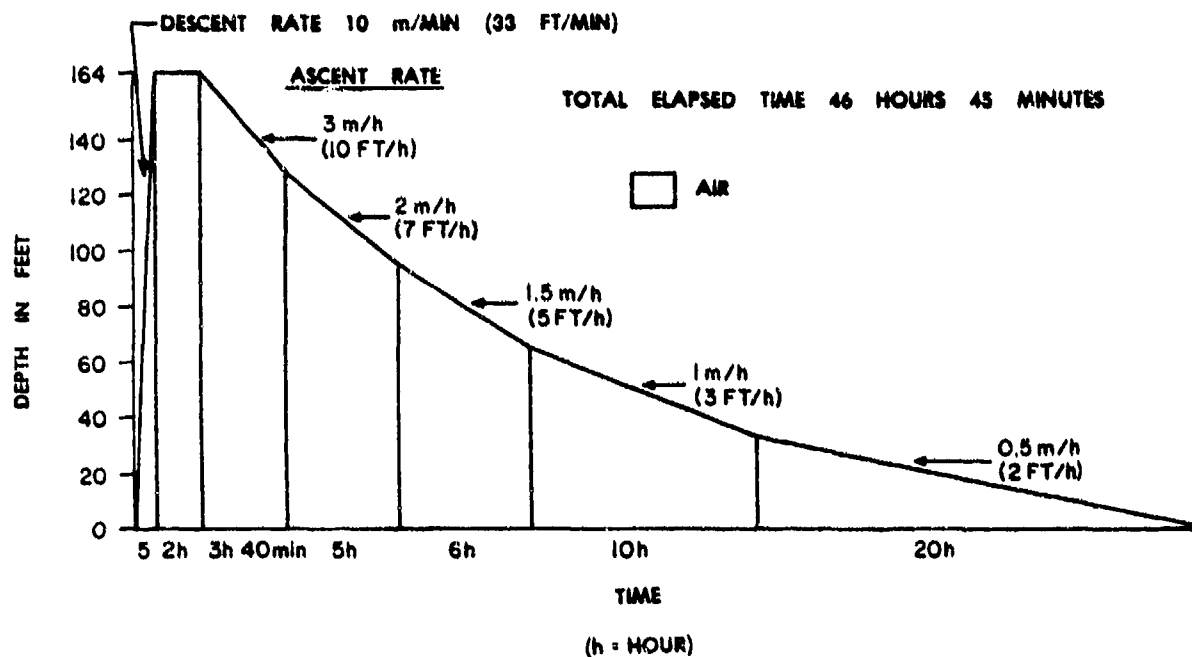
ROYAL NAVY TABLE 72--MODIFIED AIR RECOMPRESSION THERAPY*

1. Use--treatment of any decompression symptoms in lieu of the air recompression therapy if a specialist medical officer is present. The table is applicable when multiple recompression of submarine survivors is required.
2. Descent rate--10 m/min (33 ft/min).
3. Ascent rate--continuous bleed at the rates shown below.
4. Time at maximum pressure does not include the compression time.
5. Maximum pressure--may be less than that shown in the table below.
6. Oxygen--may be administered periodically to selected cases as advised by the medical officer.

Depth (ft) (meters)		Time (hours)(min)		Rate meters/hour	Breathing media	Total elapsed time (hours)(min)	
164	50	2**		--	Air	2	5
164-128	50-39	3	40	3	Air	5	45
128-95	39-29	5		2	Air	10	45
95-66	29-20	6		1.5	Air	16	45
66-33	20-10	10		1	Air	26	45
33-0	10-0	20		0.5	Air	46	45

**The period of 2 hours can be reduced and decompression started earlier if the patient's symptoms have cleared.

*Royal Navy Diving Manual (1972).



ROYAL NAVY TABLE 81--EMERGENCY THERAPY IN THE WATER*

1. Use--when emergency recompression is necessary and has to be carried out in the water because no compression chamber is available.	Depth		Time		Rate min/meter	Breathing media	Total elapsed time	
	(ft)	(meters)	(hours)	(min)			(hours)	(min)
2. Descent rate--approximately 30 m/min (98 ft/min).	98	30		5	--	Air		6
	98-66	30-20		45	4.5	Air		51
	66-33	20-10	1	20	8	Air	2	11
	33-0	10-0	2	30	15	Air	4	41
3. Ascent rate--continuous ascent at the rates shown.								
4. Time at maximum pressure does not include the descent time.								

*Royal Navy Diving Manual (1972).

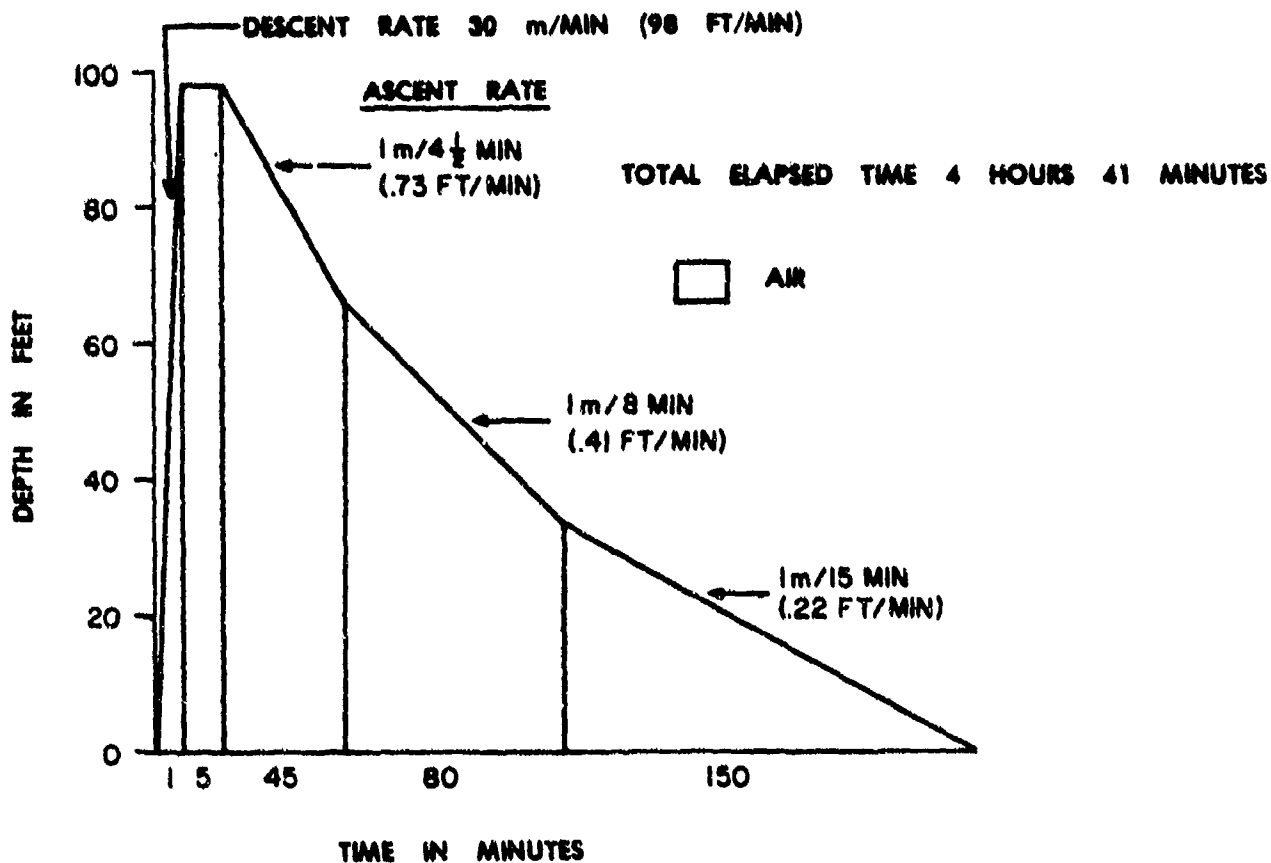


FIGURE 37

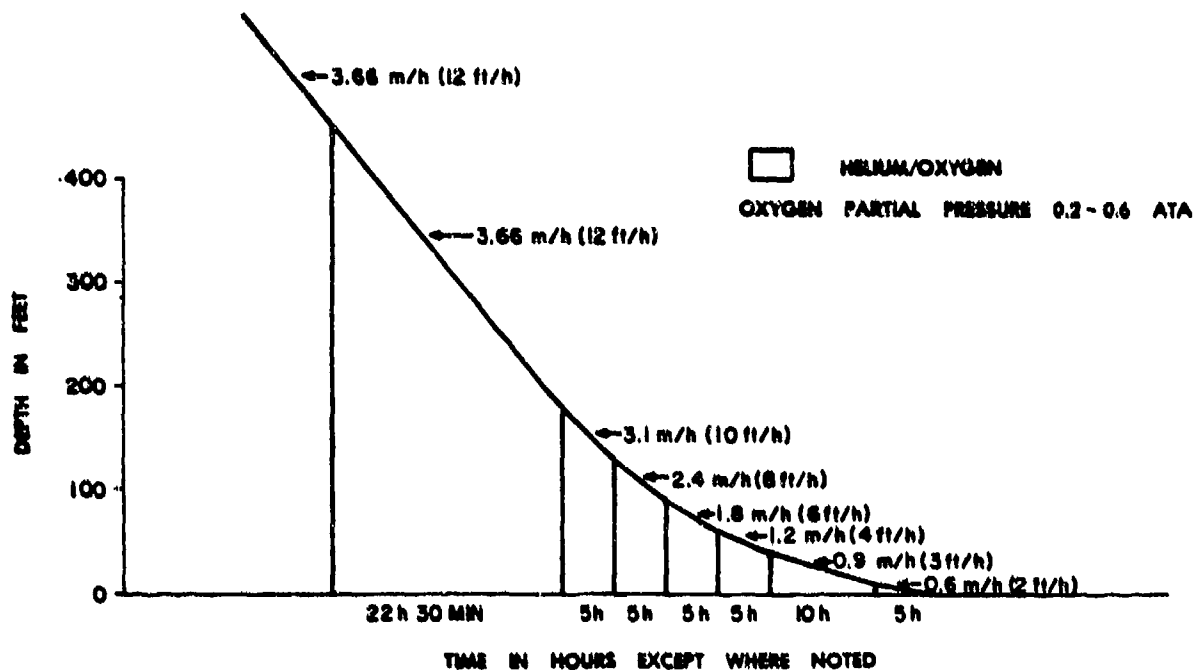
RNPL THERAPEUTIC DECOMPRESSION FROM A HELIUM-OXYGEN RECOMPRESSION*

1. Use--treatment of decompression sickness occurring during the decompression from a helium-oxygen dive. Recompress, using pure helium (oxygen partial pressure is kept between 0.2 and 0.6 atmospheres absolute [ATA]) to the depth of complete relief of symptoms, wait 30 minutes at that depth, then decompress in accordance to the following table.

Depth (ft) (meters)	Time (hours)(min)	Rate ft/hour	Breathing media	Total elapsed time
> 450 137	-	12	He-O ₂	Depends upon the treat- ment depth
450-180 137-55	22 30	12	He-O ₂	
180-130 55-40	5 0	10	He-O ₂	
130-90 40-27	5 0	8	He-O ₂	
90-60 27-18	5 0	6	He-O ₂	
60-40 18-12	5 0	4	He-O ₂	
40-10 12-3	10 0	3	He-O ₂	
10-0 3-0	5 0	2	He-O ₂	

2. Descent rate--10 m/min (33 ft/min).
3. Ascent rate--as noted below.
4. Time at the maximum pressure does not include the compression time.

*RNPL Helium Diving Tables (1968).



CIRIA UNDERWATER ENGINEERING TABLE 5-- OXYGEN RECOMPRESSION THERAPY*

1. Use--treatment of decompression sickness occurring during or after a helium-oxygen dive. For divers whose symptoms begin at atmospheric pressure, the initial recompression should be with air to 60 feet (18 m). If full relief does not occur within 10 minutes at 60 feet, further recompression is immediately required. Further recompression is done with helium (oxygen partial pressure is kept between 0.2 and 0.6 ATA) and is to the depth of complete relief. Following 30 minutes at the depth of relief, decompression is according to the table provided.	Depth (ft) (meters)		Time (hours)(min)		Rate (ft/hour)		Breathing media		Total elapsed time (hours)(min)	
	> 450	> 137	--		8		He-O ₂		Depends upon	
	450-330	137-101	20		6		He-O ₂		the	
	330-250	101-76	20		4		He-O ₂		starting depth	
	250-160	76-49	30		3		He-O ₂			
	160-20	49-6	70		2		He-O ₂			
	20-0	6-0	20		1		He-O ₂			

2. Descent rate--10 m/min.

3. Ascent rate--see table provided.

4. Time at maximum pressure does not include the compression time.

*CIRIA Oxy-Helium Diving Tables (1970).

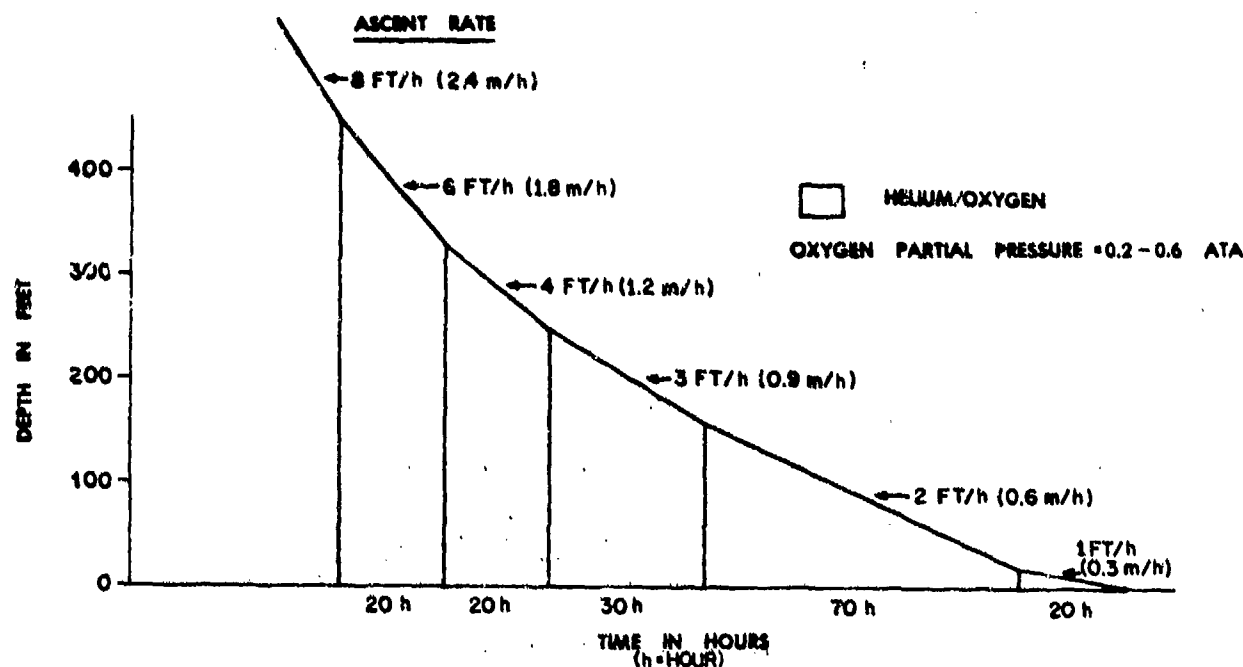


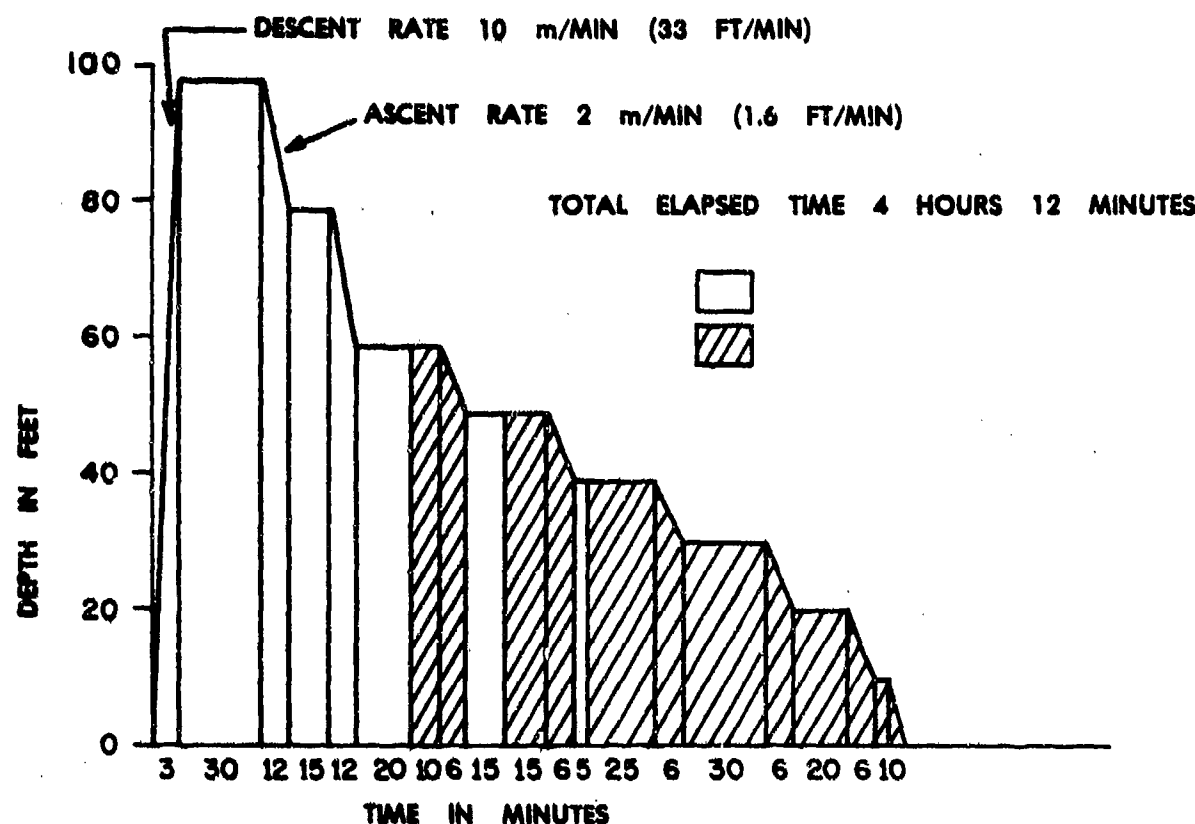
FIGURE 39

FRENCH NAVY RECOMPRESSION TREATMENT TABLE 1
(GERS 1962)*

1. Use--treatment of mild decompression sickness when oxygen is available.
2. Descent rate--10 m/min (33 ft/min).
3. Ascent rate--2 m/min (1.6 ft/min) between stops.
4. Time at 30 meters (98 ft) does not include the compression time.

*GERS (1964).

Depth (ft) (meters)		Time (min)	Breathing media	Total elapsed time (hours)(min)	
98	30	30	Air		33
79	24	15	Air	1	0
59	18	20	Air	1	32
59	18	10	Oxygen	1	42
49	15	15	Air	2	3
49	15	15	Oxygen	2	18
39	12	5	Air	2	29
39	12	25	Oxygen	2	54
30	9	30	Oxygen	3	30
20	6	20	Oxygen	3	56
10	3	5	Oxygen	4	7
10-0	3-0	5	Oxygen	4	12



FRENCH NAVY RECOMPRESSION TREATMENT TABLE 2
(GERS 1962)*

1. Use--treatment of mild to moderate decompression sickness when oxygen is available.
2. Descent rate--10 m/min (33 ft/min).
3. Ascent rate--2 min/m (1.6 ft/min) between stops.
4. Time at 50 meters (164 ft) does not include the compression time.

*GERS (1964).

Depth (ft) (meters)		Time (min)	Breathing media	Total elapsed time (hours)(min)	
164	50	30	Air		35
138	42	15	Air	1	6
118	36	15	Air	1	33
98	30	15	Air	1	60
79	24	15	Air	2	27
59	18	20	Air	2	59
59	18	10	Oxygen	3	9
49	15	15	Air	3	30
49	15	15	Oxygen	3	55
39	12	5	Air	4	6
39	12	25	Oxygen	4	31
30	9	10	Air	4	47
30	9	50	Oxygen	5	37
20	6	10	Air	5	53
20	6	20	Oxygen	6	13
10	3	20	Oxygen	6	39
10-0	3-0	5	Oxygen	6	44

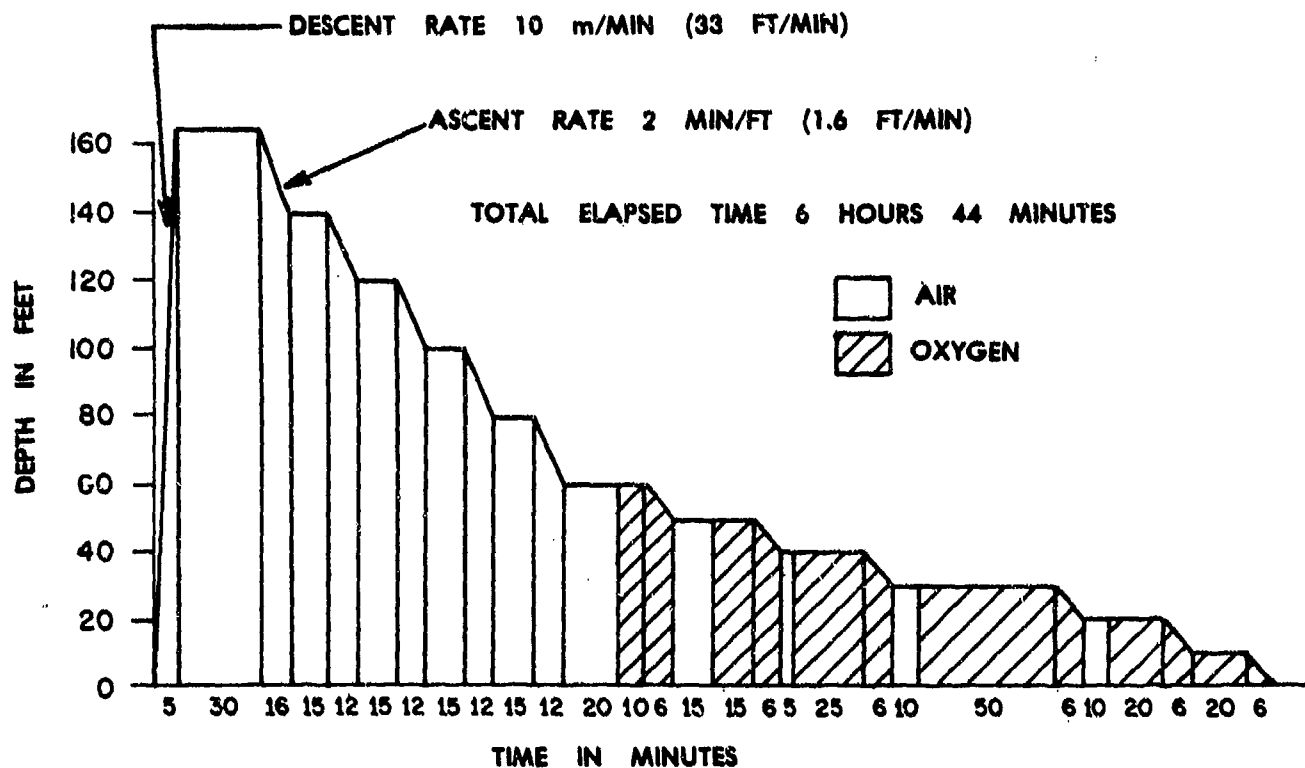


FIGURE 42

FRENCH NAVY RECOMPRESSION TREATMENT TABLE 4
(GERS 1962)*

	Depth		Time (hours)(min)	Breathing media	Total elapsed time			
	(ft)	(meters)			(hours)(min)	(hours)(min)	(hours)(min)	(hours)(min)
1. Use--treatment of severe decompression sickness when oxygen is available.								
2. Descent rate--10 m/min (33 ft/min).	164	50	30-120	Air	35	2	5	
	138	42	30	Air	1	21	2	51
	118	36	30	Air	2	3	3	33
3. Ascent rate--2 min/m (1.6 ft/min) between stops.	98	30	30	Air	2	45	4	15
	79	24	30	Air	3	27	4	57
	59	18	4	Air	7	39	9	9
4. Time at 50 meters (164 ft) does not include compression time.	59	18	2	Alternately O ₂ - Air every 15 min	9	39	11	9
	49	15	3	Air	12	45	14	15
*GERS (1964).	49	15	3	Alternately O ₂ - Air every 15 min	15	45	17	15
	39	12	6	Alternately Air- O ₂ every 30 min	21	51	23	21
	39	12	6	Air	27	57	29	27
	30	9	6	Alternately Air- O ₂ every 30 min	33	57	35	27
	30	9	6	Air	34	13	35	43
	20	6	10	Oxygen	35	3	36	33
	20	6	50	Air	35	19	36	49
	10	3	10	Oxygen	36	9	37	39
	10	3	50	Oxygen	36	14	37	44
	10-0	3-0	5					

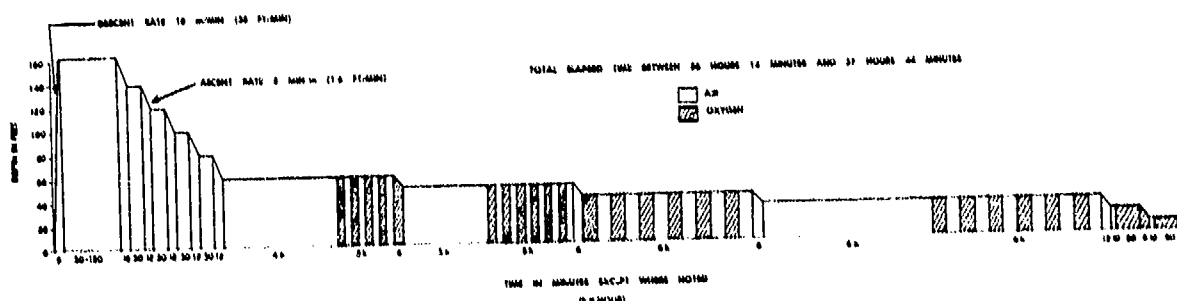


FIGURE 43

FRENCH NAVY RECOMPRESSION TREATMENT TABLE 4A
(GERS 1962)*

1. Use--treatment of severe decompression sickness when oxygen is not available.

2. Descent rate--10 m/min (33 ft/min).

3. Ascent rate--2 min/m (1.6 ft/min) between stops.

4. Time at 50 meters (164 ft) does not include the compression time.

*GERS (1964).

	Depth		Time (hours)(min)	Breathing media	Total elapsed time			
	(ft)	(meters)			(hours)(min)	(hours)(min)	(hours)(min)	(hours)(min)
	164	50	30-120	Air	35	2		
	138	42	30	Air	1	21	2	46
	118	36	30	Air	2	3	3	28
	98	30	30	Air	2	45	4	10
	79	24	30	Air	3	27	4	52
	59	18	6	Air	9	39	11	4
	49	15	6	Air	15	45	17	10
	39	12	6	Air	21	51	23	16
	30	9	12	Air	33	57	35	22
	20	6	2	Air	36	3	37	28
	10	3	2	Air	38	9	39	34
	10-0	3-0	5	Air	38	14	39	39

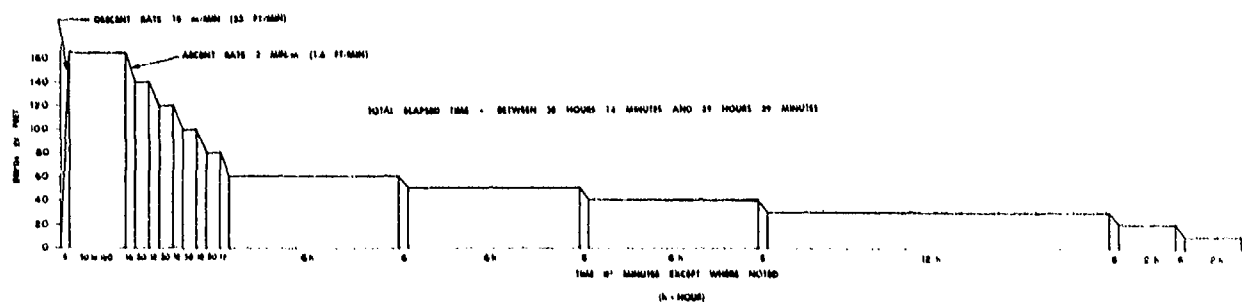


FIGURE 44

FRENCH NAVY AIR RECOMPRESSION TREATMENT TABLE
(GERS 1964)*

1. Use--treatment of decompression sickness when oxygen is not available or the patient cannot tolerate elevated oxygen partial pressures.
2. Descent rate--10 m/min (33 ft/min).
3. Ascent rate--5 minutes between stops.
4. Time at 50 meters (164 ft) does not include the compression time.

*GERS (1964). This appears to be one of two air tables that were forerunners to the current GERS Table D.

Depth		Time		Breathing media	Total elapsed time	
(ft)	(meters)	(hours)	(min)		(hours)	(min)
164	50	3		Air	3	5
138	42		30	Air	3	40
124	38		30	Air	4	15
111	34	2		Air	6	20
98	30	4		Air	10	25
85	26	6		Air	16	30
72	22	6		Air	22	35
59	18	6		Air	28	40
49	15	12		Air	40	45
39	12	8		Air	48	50
30	9	8		Air	56	55
20	6	8		Air	65	0
10	3	8		Air	73	5
10-0	3-0	5		Air	73	10

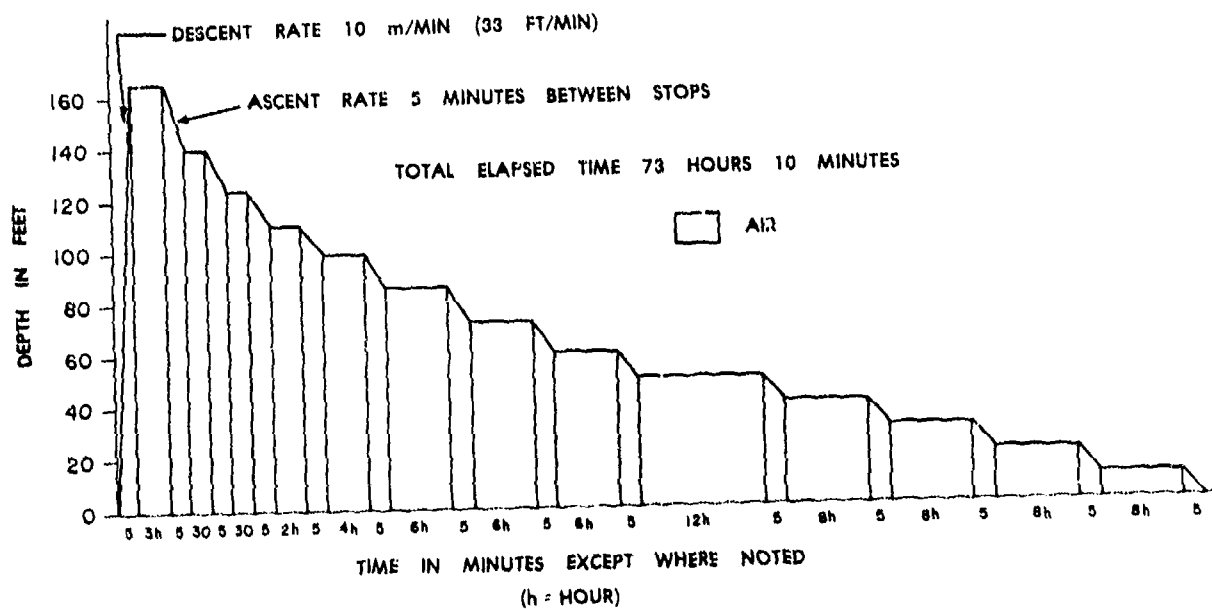


FIGURE 45

FRENCH NAVY AIR RECOMPRESSION TREATMENT TABLE
(GERS 1964)*

1. Use--treatment of decompression sickness when oxygen is not available or cannot be tolerated by the patient.

2. Descent rate--10 m/min (33 ft/min).

3. Ascent rate-- 5 minutes between stops.

4. Time at 50 meters (164 ft) does not include the compression time.

*GERS (1964). This Table appears to be one of two air tables that were forerunners to the current GERS Table D.

Depth (ft) (meters)		Time (hours)(min)		Breathing media	Total elapsed time (hours)(min)	
164	50	4		Air	4	5
138	42		30	Air	4	40
124	38	1		Air	5	45
111	34	4		Air	9	50
98	30	4		Air	13	55
85	26	6		Air	20	0
72	22	6		Air	26	5
59	18	6		Air	32	10
49	15	12		Air	44	15
39	12	8		Air	52	20
30	9	8		Air	60	25
20	6	8		Air	68	30
10	3	8		Air	76	35
10-0	3-0	5		Air	76	40

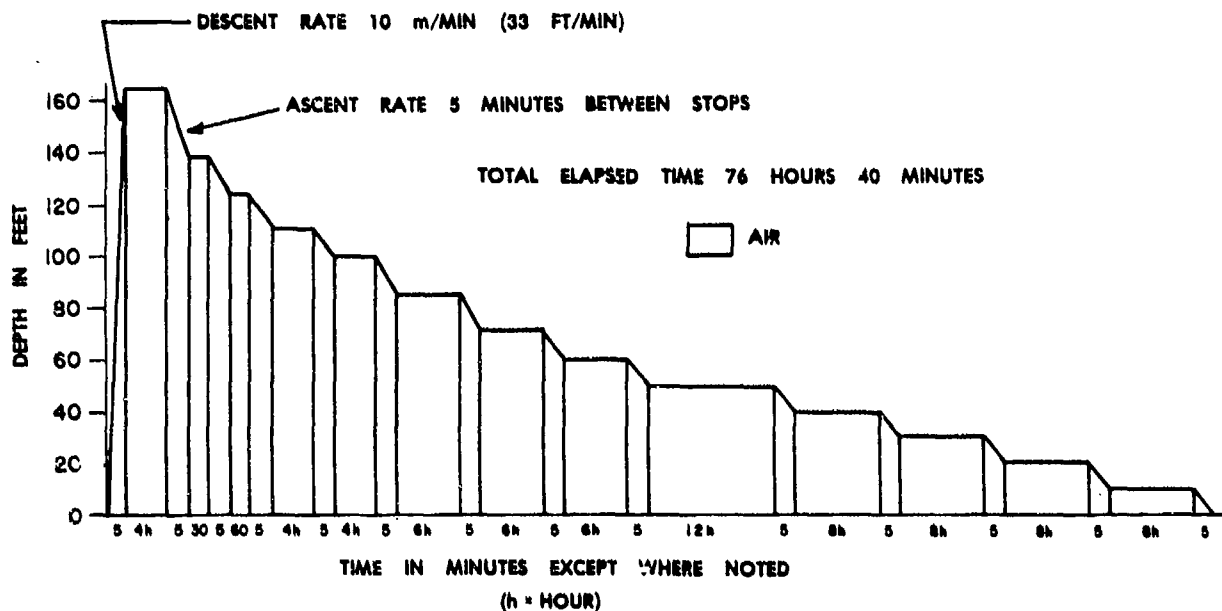


FIGURE 46

FRENCH NAVY HIGH-OXYGEN RECOMPRESSION TREATMENT TABLE
(GERS 1964)*

1. Use--treatment of moderately severe decompression sickness.
2. Descent rate--10 m/min (33 ft/min).
3. Ascent rate--2 min/m (1.6 ft/min) between stops.
4. Time at 30 meters (98 ft) does not include the compression time.

*GERS (1964). This table appears to be a forerunner to the current GERS Table C.

Depth (ft) (meters)		Time (hours)(min)	Breathing media	Total elapsed time (hours)(min)
98	30	30-120	40% O ₂	Total Elapsed Time will be between 20 hours 33 minutes and 36 hours 3 minutes depending on the time spent at various stops.
79	24	60	60% O ₂	
69	21	60	60% O ₂	
59	18	60	60% O ₂	
49	15	2	Alternately O ₂ -Air 30 min each	
39	12	6-12	Alternately O ₂ -Air 60 min each	
30	9	6-12	Alternately O ₂ -Air 60 min each	
20	6	1-2	Oxygen	
10	3	1-2	Oxygen	
10-0	3-0	6	Oxygen	

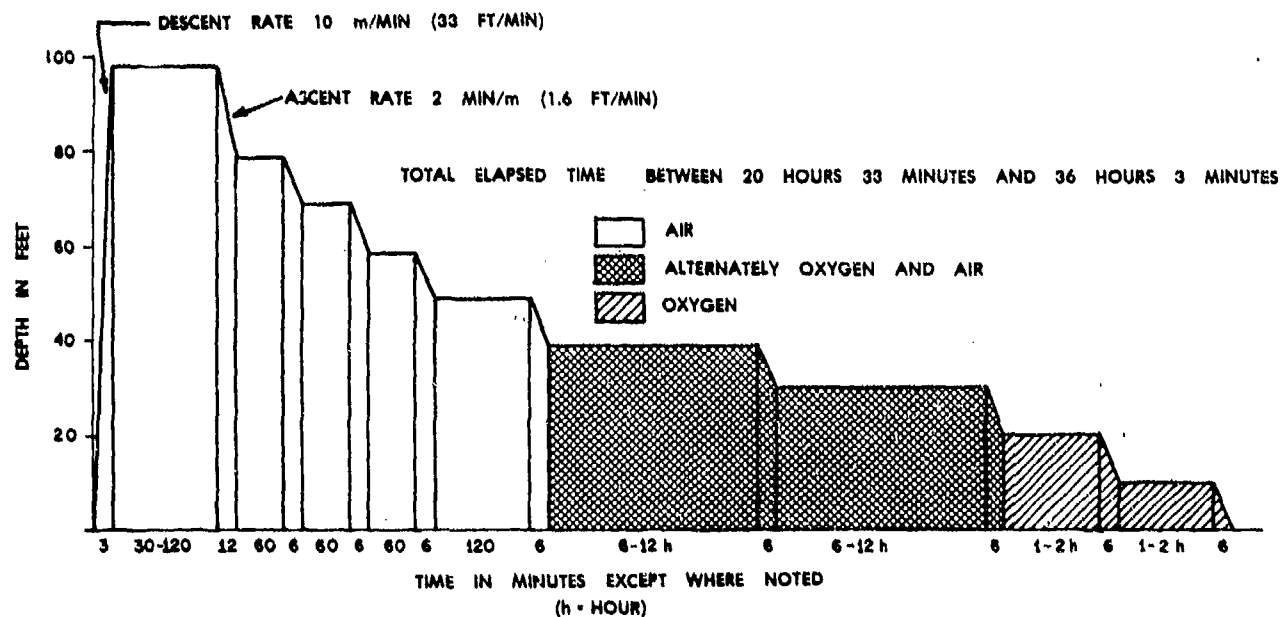
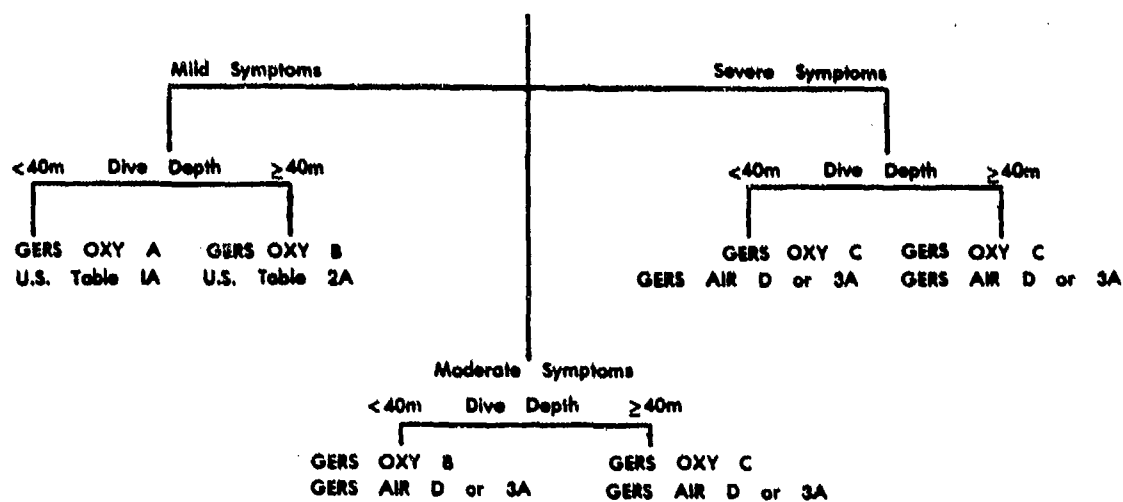


FIGURE 47

TREATMENT OF DECOMPRESSION SICKNESS

1968★



★ From: COMEX Diving Ltd. Medical Book II (1976).

FIGURE 48

FRENCH NAVY RECOMPRESSION TREATMENT TABLE A
(GERS 1968)*

1. Use--treatment of mild decompression sickness occurring during dives to less than 40 meters (131 ft).
2. Descent rate--10 m/min (33 ft/min).
3. Ascent rate--2 min/m (1.64 ft/min) between stops.
4. Time at 30 meters (98 ft) does not include the compression time.

*GERS (1968).

Depth (ft) (meters)		Time (min)	Breathing media	Total elapsed time (hours)(min)	
98	30	30	40% O ₂	1	33
79	24	30	40-60% O ₂	1	15
69	21	30	60% O ₂	1	51
59	18	30	60% O ₂	2	27
49	15	30	60% O ₂	3	3
39	12	30	100% O ₂	3	39
30	9	30	100% O ₂	4	15
20	6	30	100% O ₂	4	51
10	3	30	100% O ₂	5	27
10-0	3-0	6	100% O ₂	5	33

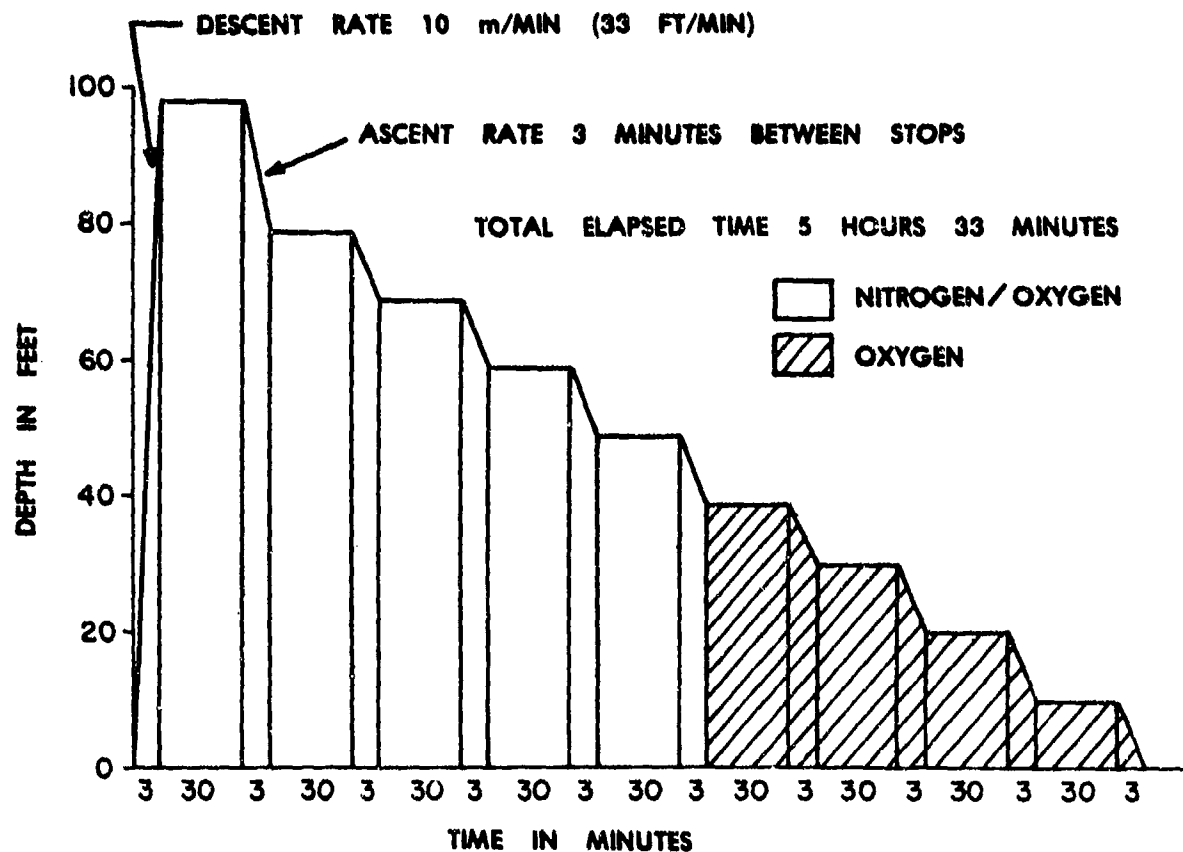


FIGURE 49

FRENCH NAVY RECOMPRESSION TREATMENT TABLE B
(GERS 1968)*

1. Use--treatment of mild decompression sickness occurring during dives to greater than 40 meters (131 ft) or for moderately severe decompression sickness occurring on dives to less than 40 meters.

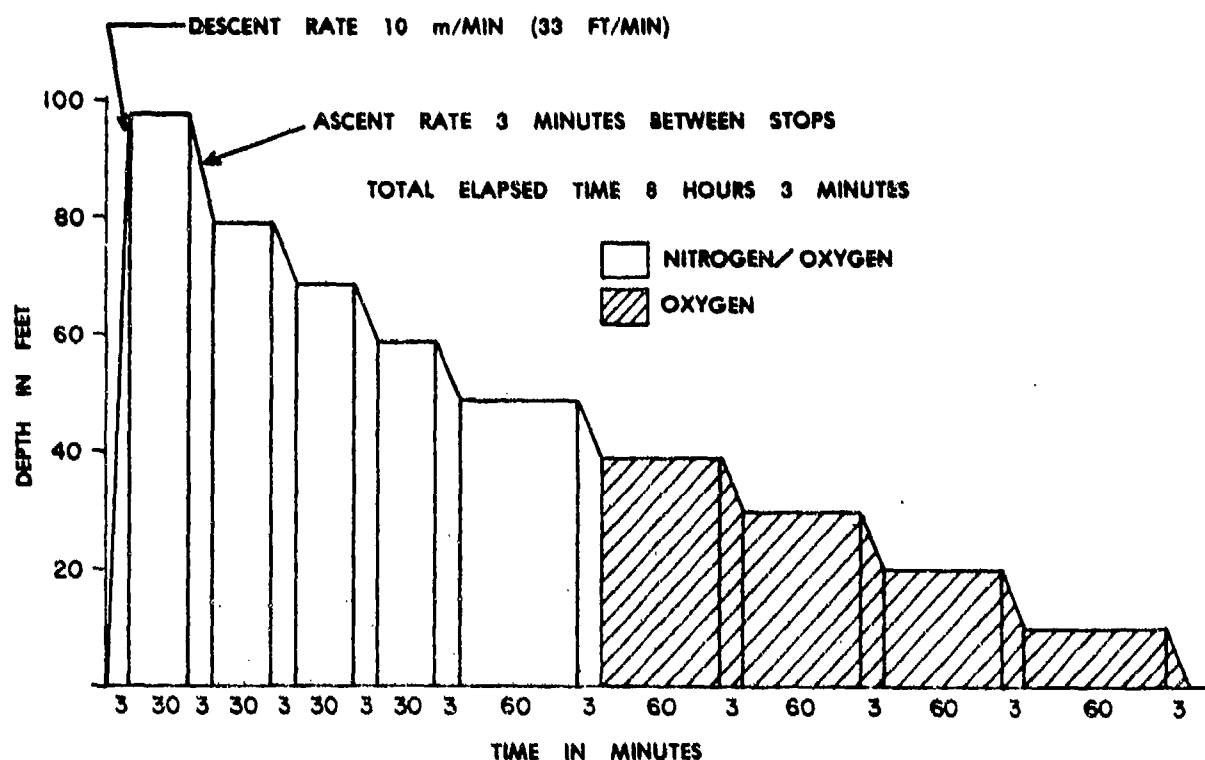
2. Descent rate--10 m/min (33 ft/min).

3. Ascent rate--2 min/m (1.64 ft/min) between stops.

4. Time at 30 meters (98 ft) does not include the compression time.

*GERS (1968).

Depth (ft) (meters)		Time (min)	Breathing media	Total elapsed time (hours)(min)	
98	30	30	40% O ₂		33
79	24	30	40-60% O ₂	1	15
69	21	30	60% O ₂	1	51
59	18	30	60% O ₂	2	27
49	15	60	60% O ₂	3	33
39	12	60	100% O ₂	4	39
30	9	60	100% O ₂	5	45
20	6	60	100% O ₂	6	51
10	3	60	100% O ₂	7	57
10-0	3-0	6	100% O ₂	8	3



FRENCH NAVY RECOMPRESSION TREATMENT TABLE C
(GERS 1968)*

1. Use--treatment of moderately severe decompression sickness occurring on dives deeper than 40 meters (131 ft) or for treating severe decompression sickness occurring on dives shallower than 40 meters.
2. Descent rate--10 m/min (33 ft/min).
3. Ascent rate--2 min/m (1.64 ft/min) between stops.
4. Time at 30 meters (98 ft) does not include the compression time.

Depth (ft)	Depth (meters)	Time (hours)(min)	Breathing media	Total elapsed time (hours)(min)
98	30	30-120	40% O ₂	Depends upon the length of the stops selected. It could range from 14 h 29 minutes to 36 h 57 minutes.
79	24	60	40-60% O ₂	
69	21	60	60% O ₂	
59	18	60-120	5 min O ₂ =15 air or 60% O ₂	
49	15	1	30 min O ₂ -15 air or 60% O ₂	
39	12	2, 6, or 12*	1 hour O ₂ -1 hour air or 60% O ₂	
30	9	6 or 12	1 hour O ₂ -1 hour air or 60% O ₂	
20	6	1-2	100% O ₂	
10	3	1-2	100% O ₂	
10-0	3-0	6	100% O ₂	

*GERS (1968). These durations can be extended; the rhythm of administration of oxygen becomes 1 hour (h) oxygen-2 hours air, starting from the 12th hour.

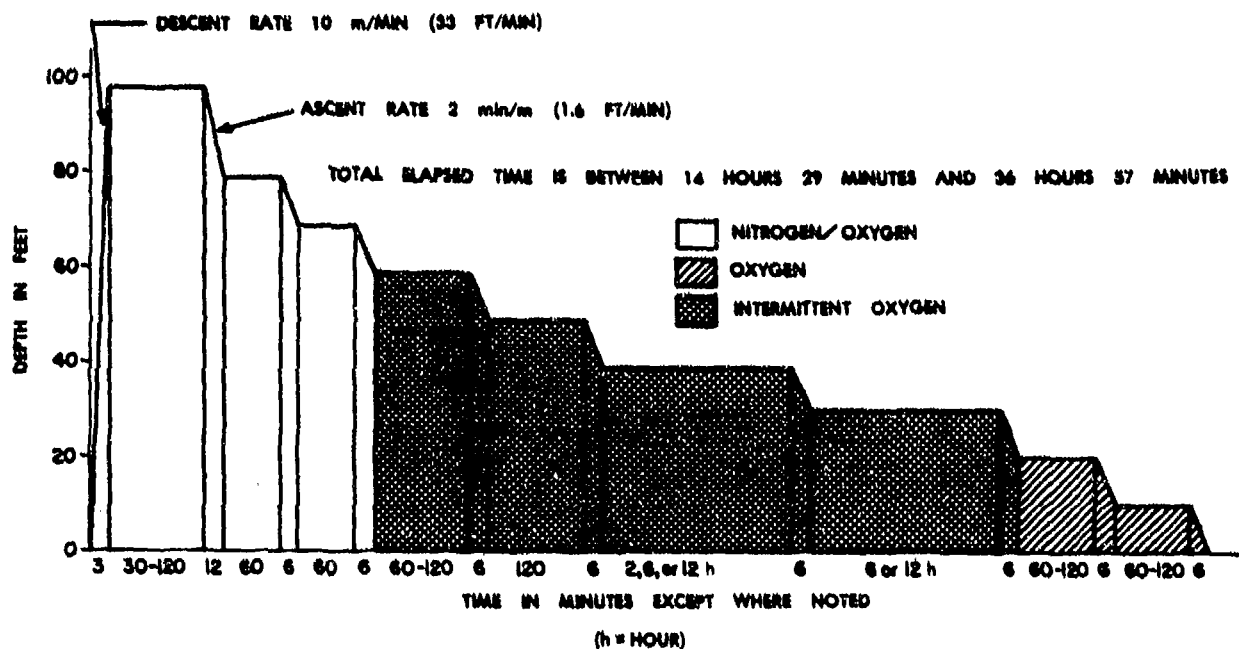


FIGURE 51

FRENCH NAVY RECOMPRESSION TREATMENT TABLE D
(GERS 1968)*

1. Use--treatment of moderately severe and severe decompression sickness when oxygen is either not available or cannot be tolerated by the patient.
2. Descent rate--10 m/min (33 ft/min).
3. Ascent rate--2 min/m (1.64 ft/min) between stops.
4. Time at 50 meters (164 ft) does not include the compression time.

*GERS (1968).

Depth (ft) (meters)		Time (hours)(min)		Breathing media	Total elapsed time (hours)(min)	
164	50	3		Air	3	5
138	42		30	Air	3	51
118	36		30	Air	4	33
108	33	2		Air	6	39
98	30	4		Air	10	45
89	27	4		Air	14	51
79	24	6		Air	20	57
69	21	6		Air	27	3
59	18	6		Air	33	9
49	15	12		Air	45	15
39	12	6-8		Air	51	21
30	9	6-8		Air	57	27
20	6	6-8		Air	63	33
10	3	6-8		Air	69	39
10-0	3-0		6	Air	69	45

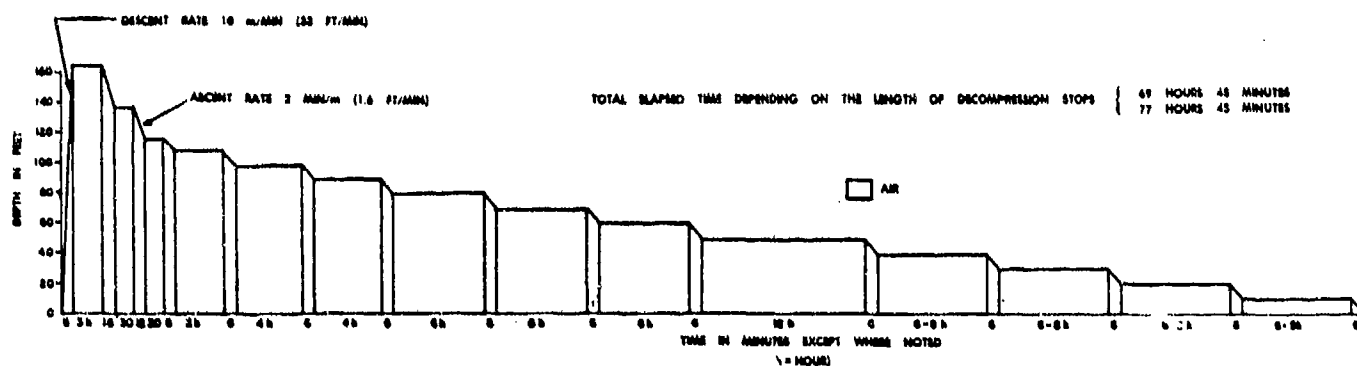


FIGURE 52

FRENCH NAVY RECOMPRESSION TREATMENT TABLE 1A
(GERS 1968)*

1. Use--treatment of mild decompression sickness occurring during dives to less than 40 meters (131 ft) when oxygen is not available or the patient can no longer tolerate breathing increased oxygen partial pressures.
2. Descent rate--10 m/min (33 ft/min).
3. Ascent rate--2 min/m (1.6 ft/min) between stops.
4. Time at 30 meters (98 ft) does not include the compression time.

Depth		Time		Breathing media	Total elapsed time	
(ft)	(meters)	(hours)	(min)		(hours)	(min)
98	30		30	Air		33
79	24		15	Air	1	0
59	18		30	Air	1	42
49	15		30	Air	2	18
39	12		30	Air	2	54
30	9		60	Air	4	0
20	6		60	Air	5	6
10	3	2		Air	7	12
10-0	3-0		6		7	18

*GERS (1968).

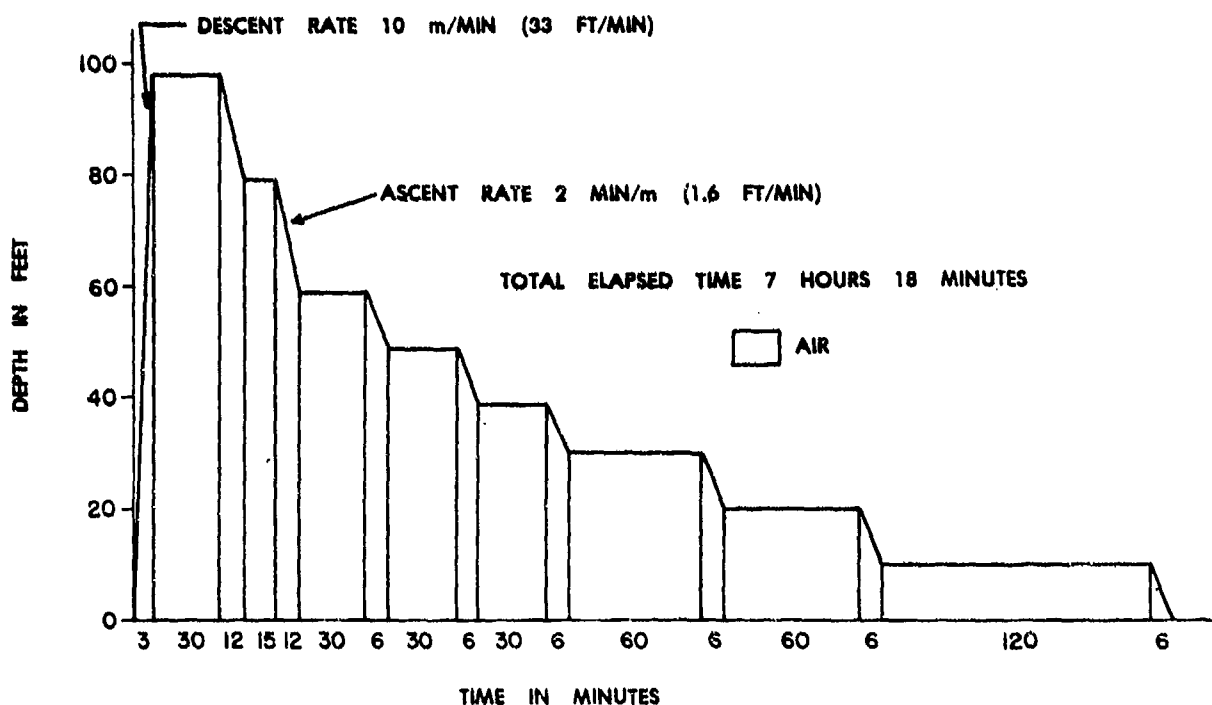


FIGURE 53

FRENCH NAVY RECOMPRESSION TREATMENT TABLE 2A
(GERS, 1968)*

1. Use--treatment of mild decompression sickness occurring during dives to greater than 40 meters (131 ft) when oxygen is not available or the patient can no longer tolerate the elevated oxygen partial pressure.

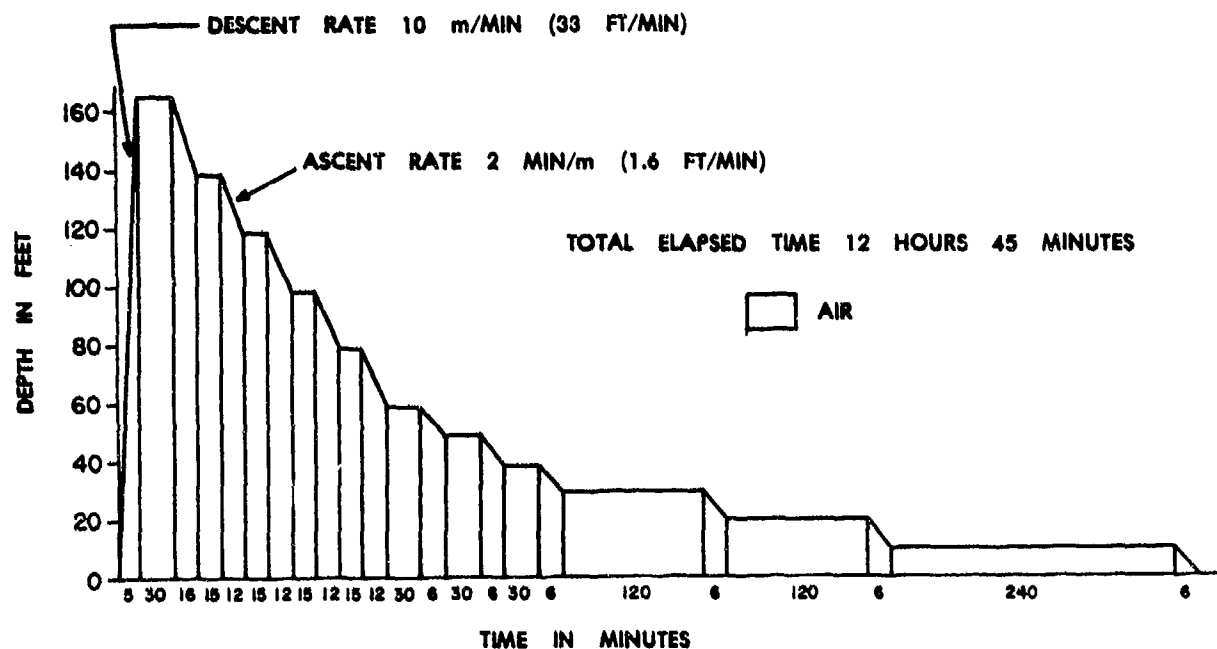
2. Descent rate--10 m/min (33 ft/min).

3. Ascent rate--2 min/m (1.6 ft/min) between stops.

4. Time at 50 meters (164 ft) does not include the compression time.

Depth (ft)	Depth (meters)	Time (hours)(min)	Breathing media	Total elapsed time (hours)(min)
164	50	30	Air	35
138	42	15	Air	1 6
118	36	15	Air	1 33
98	30	15	Air	2 0
79	24	15	Air	2 27
59	18	30	Air	3 9
49	15	30	Air	3 45
39	12	30	Air	4 21
30	9	2	Air	6 27
20	6	2	Air	8 33
10	3	4	Air	12 39
10-0	3-0	6	Air	12 45

*GERS (1968).



FRENCH NAVY RECOMPRESSION TREATMENT TABLE 3A
(GERS 1968)*

1. Use--treatment of moderate or severe decompression sickness when oxygen is not available or the patient cannot tolerate the elevated oxygen partial pressure.
2. Descent rate--10 m/min (33 ft/min).
3. Ascent rate--2 min/m (1.6 ft/min) between stops.
4. Time at 50 meters (164 ft) does not include the compression time.

*GERS (1968).

Depth		Time		Breathing media	Total elapsed time	
(ft)	(meters)	(hours)	(min)		(hours)	(min)
164	50		30	Air		35
138	42		15	Air	1	6
118	36		15	Air	1	33
98	30		15	Air	2	0
79	24		15	Air	2	27
59	18		30	Air	3	9
49	15		30	Air	3	45
39	12		30	Air	4	21
30	9	12		Air	16	27
20	6	2		Air	18	33
10	3	2		Air	20	39
10-0	3-0		6		20	45

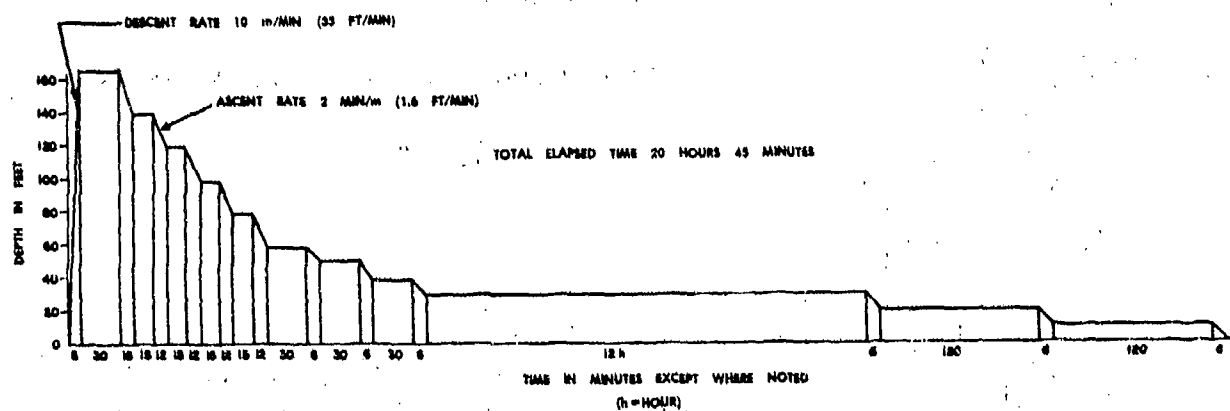
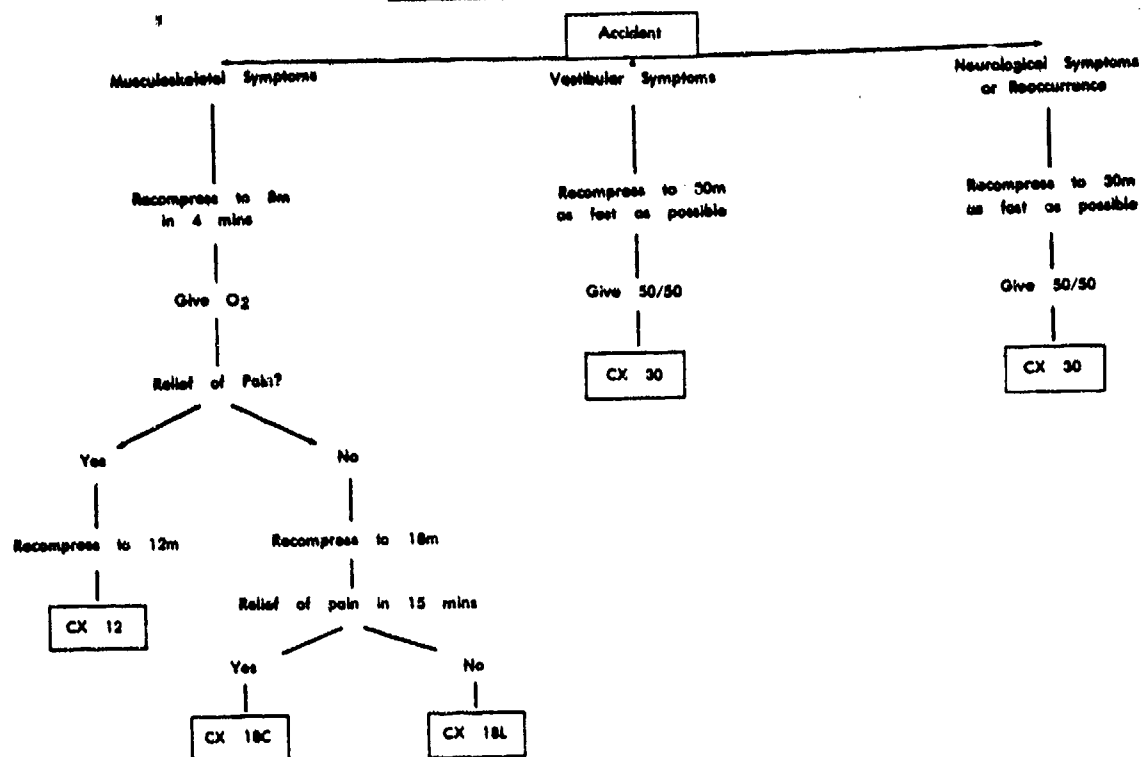


FIGURE 55

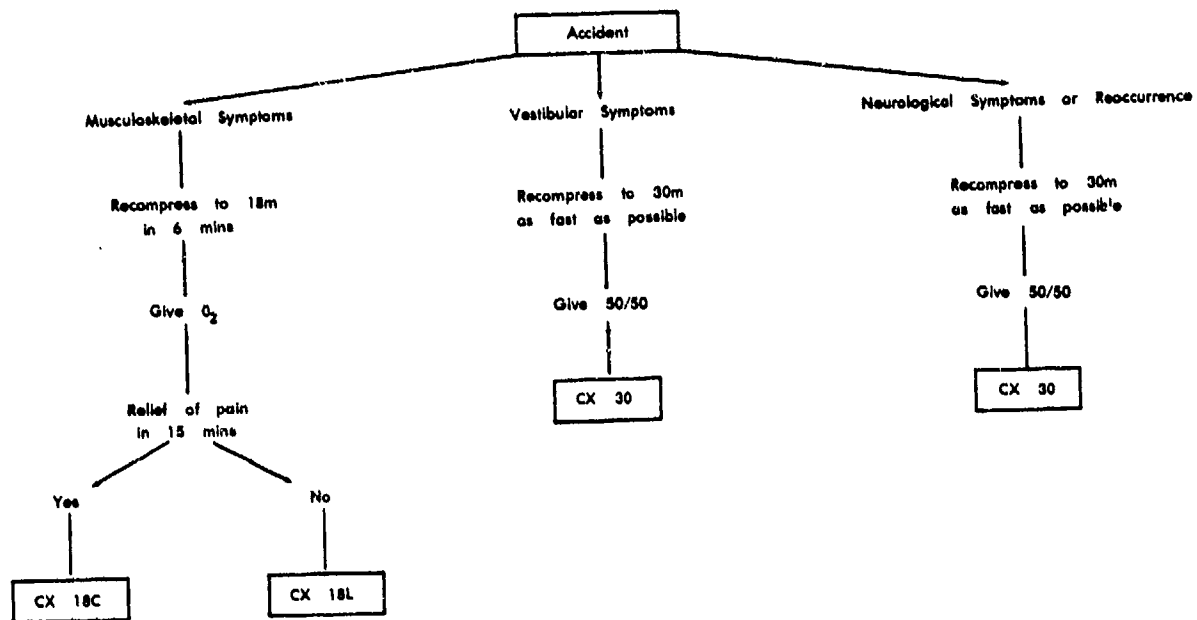
Accident following NORMAL DECOMPRESSION *



* From: COMEX Diving Ltd. Medical Book II (1976).

FIGURE 56

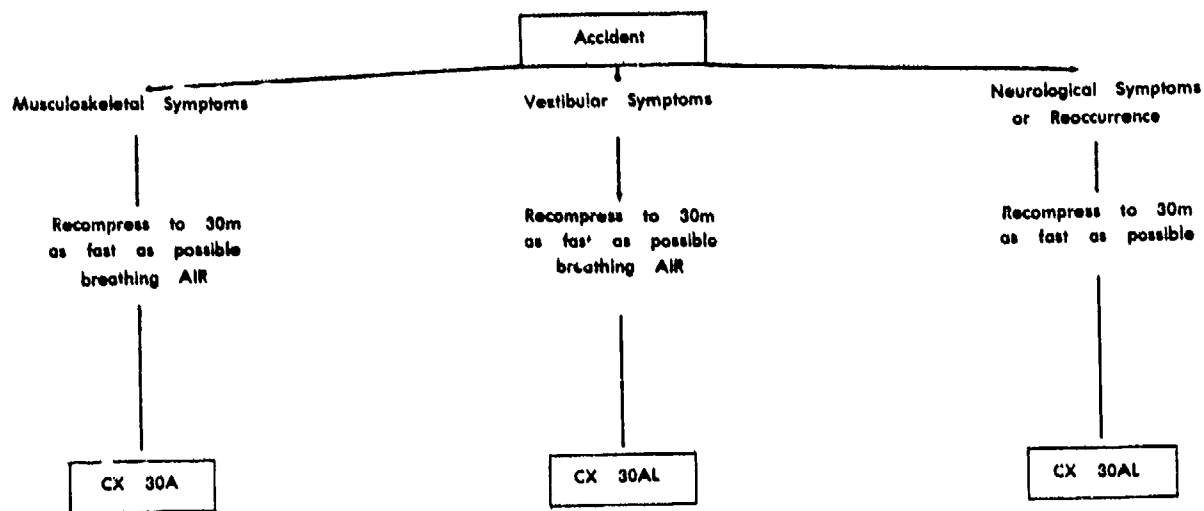
Accidents following SHORTENED DECOMPRESSION *



*From: COMEX Diving Ltd. Medical Book II (1976).

FIGURE 57

Accidents following SHORTENED DECOMPRESSION
Involving HYPEROXIC CRISIS *



*From: COMEX Diving Ltd. Medical Book II (1976).

FIGURE 58

65

COMEX THERAPEUTIC TABLE CX 12*

1. Use--treatment of musculoskeletal decompression sickness following a normal decompression in which symptoms are relieved within 4 minutes at or less than 8 meters (26 ft).
2. Descent rate--need not be rapid, 2-3 m/min (6.6-10 ft/min).
3. Ascent rate--0.5 m/min (1.6 ft/min).
4. Time at 12 meters does not include the compression time or time spent at 8 meters.

*COMEX (1976).

Depth (ft) (meters)		Time (min)	Breathing media	Total elapsed time (hours)(min)
26	8	4	Oxygen	4
39	12	20	Oxygen	26
39	12	5	Air	31
39	12	20	Oxygen	51
39	12	5	Air	56
39	12	20	Oxygen	1 16
39	12	5	Air	1 21
39	12	20	Oxygen	1 41
39	12	5	Air	1 46
39-0	12-0	24	Oxygen	2 10

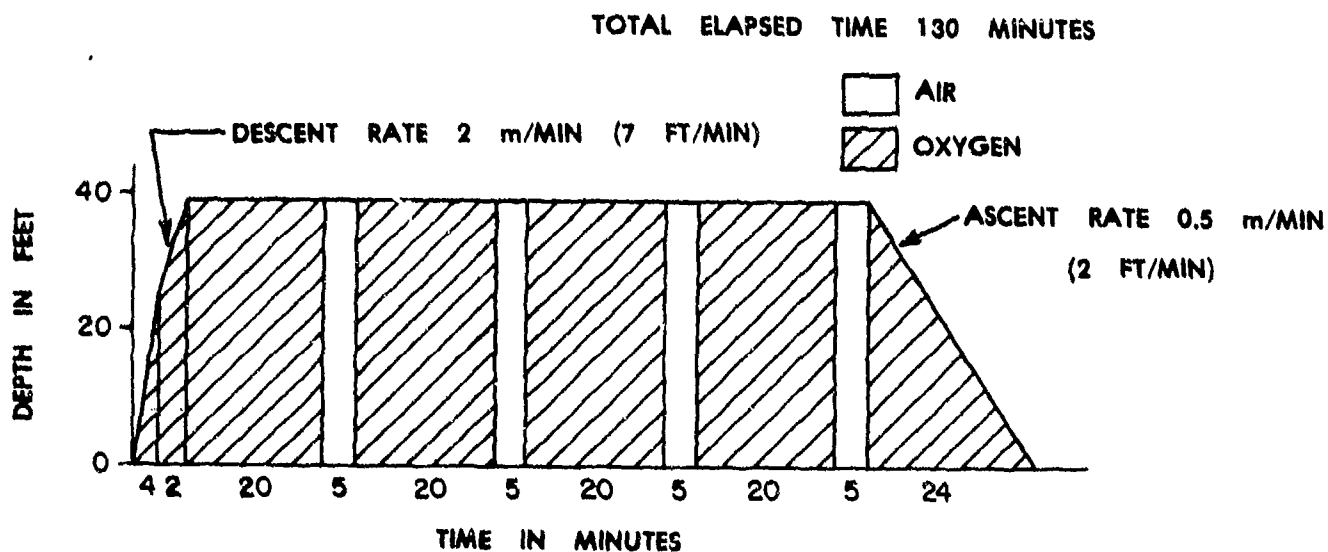


FIGURE 59

COMEX THERAPEUTIC TABLE 18C*

1. Use--treatment of musculoskeletal decompression sickness following either a normal or shortened decompression where symptoms are not relieved within 4 minutes at 8 meters, but are relieved within 15 minutes at or less than 18 meters (59 ft).
2. Descent rate--need not be rapid, 2-3 m/min (7-10 ft/min).
3. Ascent rate--6 min/m between 18 and 12 meters 2 min/m between 12 and 0 meters.
4. Time at 18 meters does not include the compression time.

Depth (ft) (meters)		Time (min)	Breathing media	Total elapsed time (hours)(min)	
0-26	0-8	4	Oxygen	4	
26-59	8-18	5	Oxygen	9	
59	18	20	Oxygen	29	
59	18	5	Air	34	
59	18	20	Oxygen	54	
59	18	5	Air	59	
59-39	18-12	36	Oxygen	1	36
39	12	5	Air	1	40
39	12	20	Oxygen	2	0
39	12	5	Air	2	5
39	12	20	Oxygen	2	25
39	12	5	Air	2	30
39-0	12-0	24	Oxygen	2	54

*COMEX (1976).

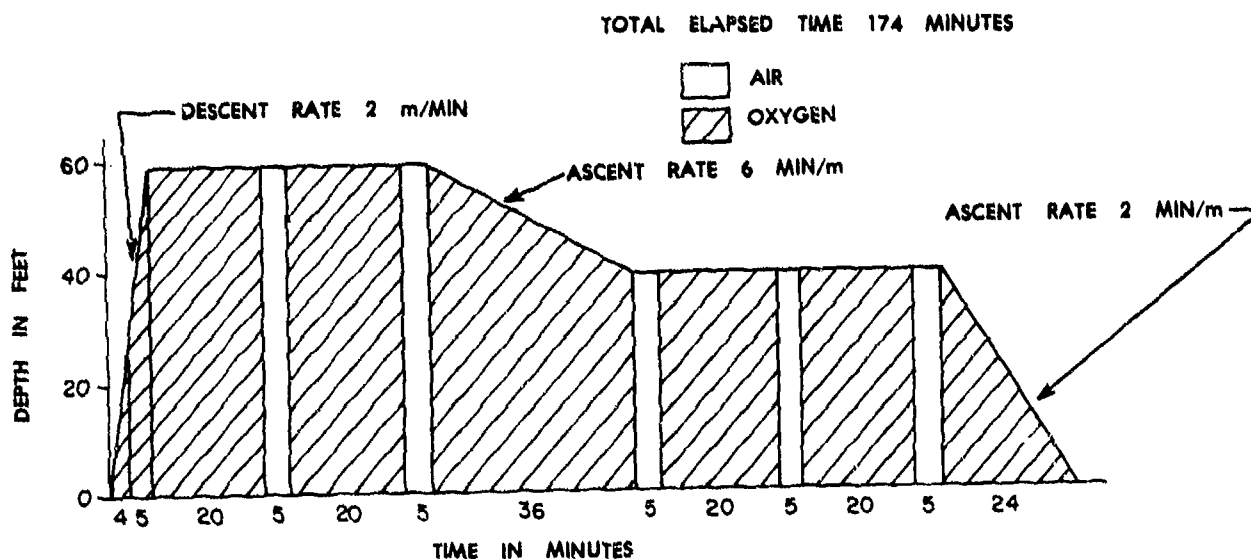


FIGURE 60

COMEX THERAPEUTIC TABLE 18L*

1. Use--treatment of musculoskeletal decompression sickness following either a normal or shortened decompression in which symptoms were not relieved within 4 minutes at 8 meters, nor were they relieved within 15 minutes at 18 meters.

2. Descent rate--need not be rapid, 2-3 m/min (7-10 ft/min).

3. Ascent rate--6 min/m between 18 and 12 meters, 2 min/m between 12 and 0 meters.

4. Time at 18 meters does not include the compression time.

*COMEX (1976).

Depth (ft) (meters)	Time (min)	Breathing media	Total elapsed time (hours)(min)
0-26 0-8	4	Oxygen	4
26-59 8-18	5	Oxygen	9
59 18	20	Oxygen	29
59 18	5	Air	34
59 18	20	Oxygen	54
59 18	5	Air	59
59 18	20	Oxygen	1 19
59 18	5	Air	1 24
59-39 18-12	36	Oxygen	2 0
39 12	10	Air	2 10
39 12	40	Oxygen	2 50
39 12	10	Air	3 0
39 12	40	Oxygen	3 40
39 12	10	Air	3 50
39 12	40	Oxygen	4 30
39 12	5	Air	4 35
39-0 12-0	24	Oxygen	4 59

TOTAL ELAPSED TIME 4 HOURS 59 MINUTES

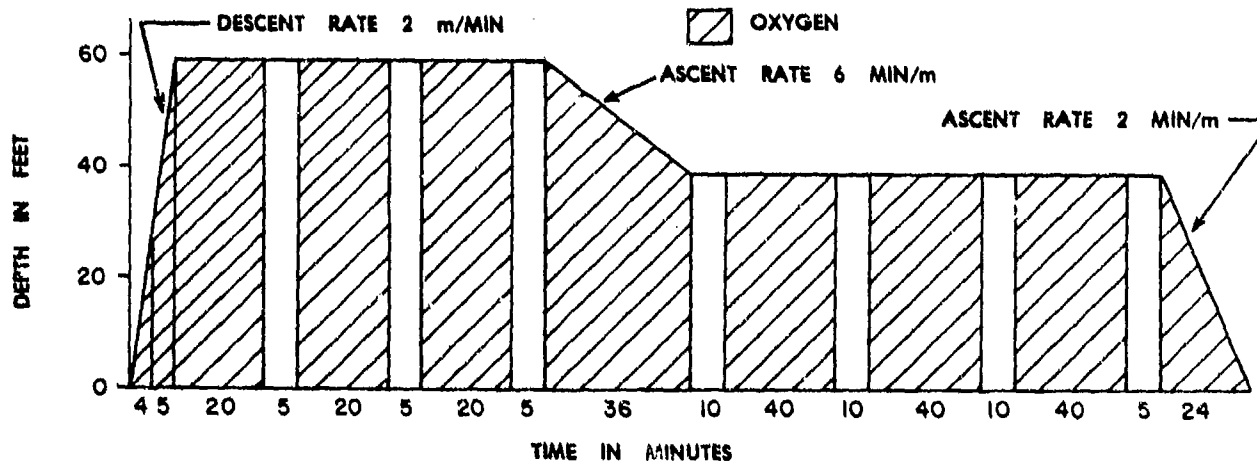


FIGURE 61

COMEX THERAPEUTIC TABLE CX 30*

1. Use--treatment of vestibular and general neurological decompression sickness occurring after either a normal or shortened decompression.
2. Descent rate--as quickly as possible, in 2 or 3 minutes.
3. Ascent rate--between 30 and 24 meters--5 min/m
24 and 18 meters--5 min/m
18 and 12 meters--5 min/m
12 and 0 meters-- 2 min/m
4. Time at 30 meters does not include the compression time.

*COMEX (1976).

Depth (ft) (meters)	Time (min)	Breathing media	Total elapsed time (hours)(min)
98 30	40	50/50	43
98-79 30-24	30 { 5 25	Air	1 13
79 24	5	50/50	1 18
79 24	25	Air	1 43
79-59 24-18	30 { 5 25	50/50	2 13
59 18	5	Air	2 18
59 18	25	Oxygen	2 43
59 18	5	Air	2 48
59 18	25	Oxygen	3 13
59-39 18-12	30 { 5 25	Air	3 43
39 12	10	Oxygen	3 53
39 12	45	Air	4 38
39 12	10	Oxygen	4 48
39 12	45	Air	5 33
39 12	10	Oxygen	5 43
39 12	45	Air	6 28
39 12	10	Oxygen	6 38
39-0 12-0	24	Air	7 2

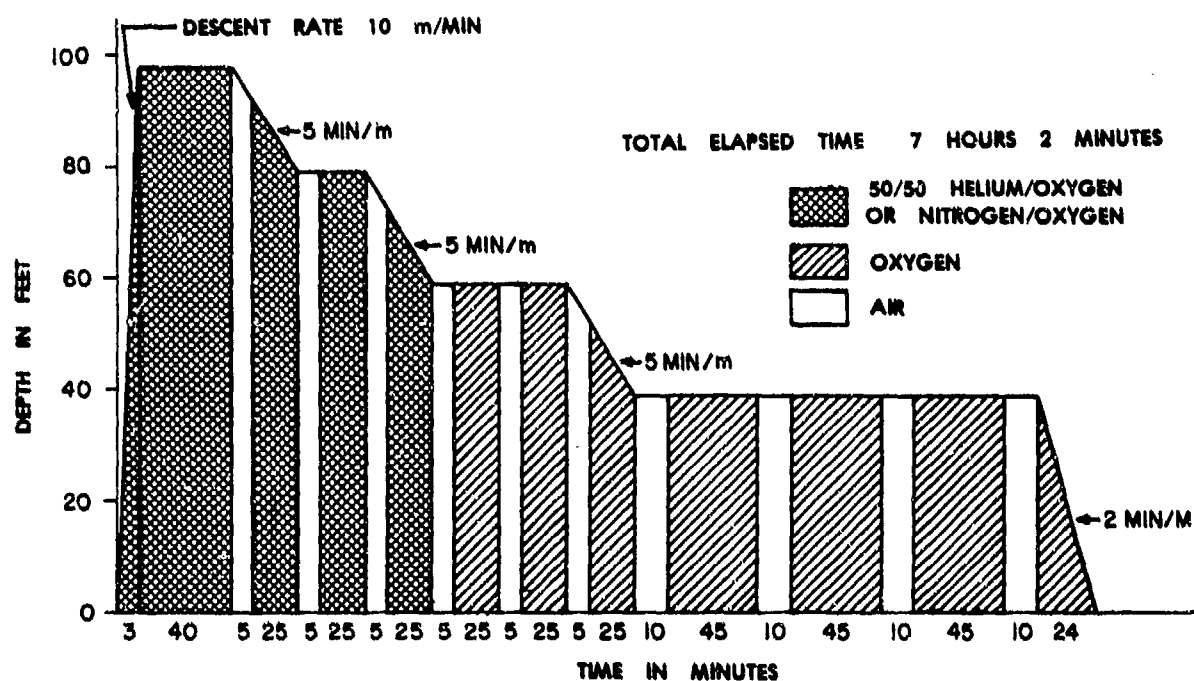


FIGURE 62

COMEX THERAPEUTIC TABLE CX 30 A*

1. Use--treatment of musculoskeletal decompression sickness when signs of oxygen poisoning are present.

2. Descent rate--as quickly or possible using air, 2 to 3 minutes.

3. Ascent rate--continuous ascent at the rates shown below.

4. Time at 30 meters (98 ft) does not include the compression time.

*COMEX (1976).

	Depth (ft) (meters)		Time (hours)(min)		Rate min/meter	Breathing media	Total elapsed time (hours)(min)	
	98	30	1		-	Air	1	3
	98-79	30-24		6	1	Air	1	9
	79-69	24-21	1		20	Air	2	9
	69-59	21-18	1	6	22	Air	3	15
	59-49	18-15	1	12	24	Air	4	27
	49-39	15-12	1	18	26	Air	5	45
	39	12		10	-	Air	5	55
	39	12		40	-	Oxygen	6	35
	39	12		10	-	Air	6	45
	39	12		40	-	Oxygen	7	25
	39	12		10	-	Air	7	35
	39	12		40	-	Oxygen	8	15
	39	12		5	-	Air	8	20
	39-0	12-0		24	2	Oxygen	8	44

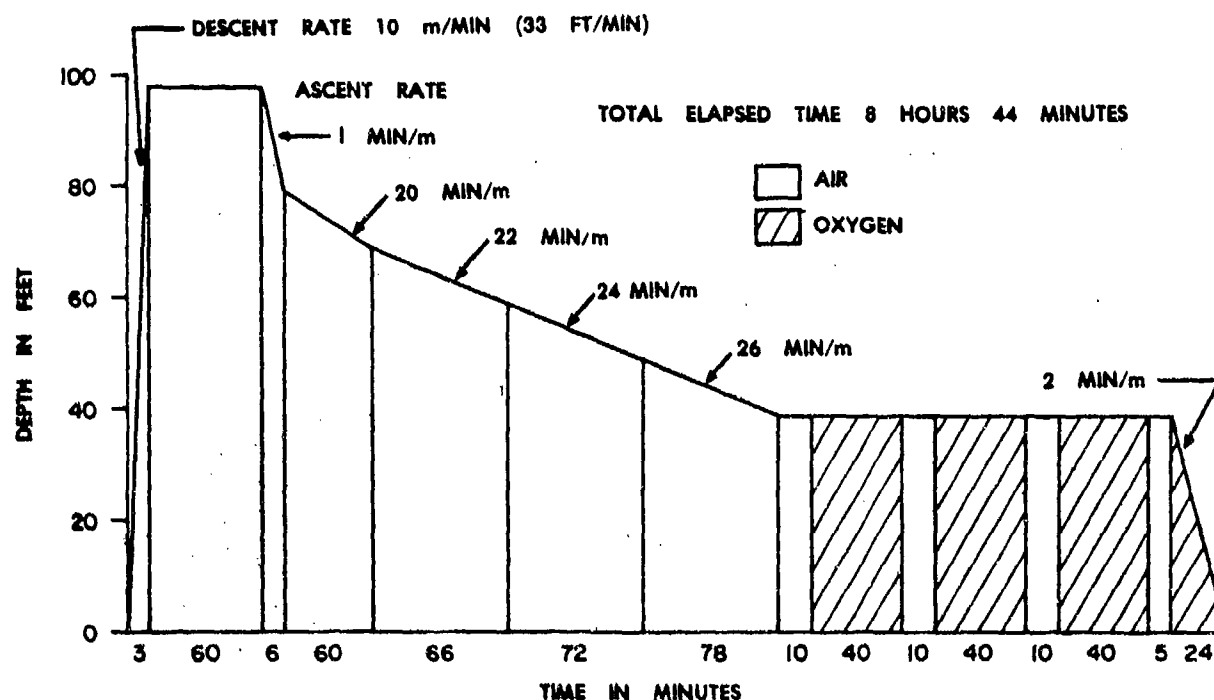


FIGURE 63

COMEX THERAPEUTIC TABLE CX 30 AL*

1. Use--treatment of vestibular and general neurological decompression sickness when signs of oxygen poisoning are present.

2. Descent rate--as quickly as possible with air, 2-3 minutes.

3. Ascent rate--for the continuous portion of the ascent the rates are shown in the table provided.

4. Time at 30 meters does not include the compression time.

*COMEX (1976).

	Depth (ft) (meters)	Time (hours)(min)	Rate (min/meter)	Breathing media	Total elapsed time (hours)(min)
	98 30	1 30	-	Air	1 33
	98-79 30-24	1 6	1	Air	1 39
2.	79-69 24-21	1 15	25	Air	2 54
	69-59 21-18	1 30	30	Air	4 24
3.	59-49 18-15	1 45	35	Air	6 9
	49-39 15-12	2	40	Air	8 9
	39 12	10	-	Air	8 19
	39 12	40	-	Oxygen	8 59
4.	39 12	10	-	Air	9 9
	39 12	40	-	Oxygen	9 49
	39 12	10	-	Air	9 59
	39 12	40	-	Oxygen	10 39
	39 12	5	-	Air	10 44
	39-0 12-0	24	2	Oxygen	11 8

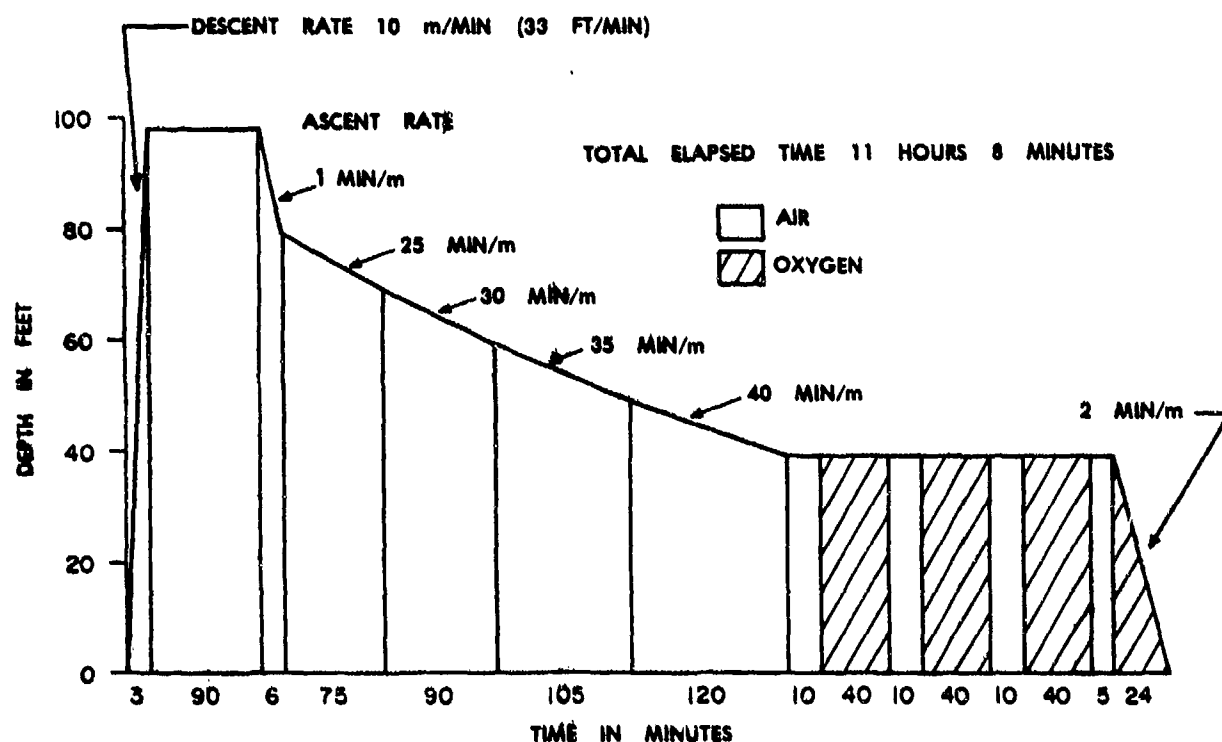


FIGURE 64

RUSSIAN THERAPEUTIC RECOMPRESSION REGIMEN I*

1. Use--treatment of light forms of decompression sickness (itching of the skin, skin rash, or light muscular pains and pains in the joints) in cases where the symptoms are completely relieved upon reaching a pressure equivalent to 96 feet.
2. Descent rate--33 ft/min.
3. Ascent rate--1-2 minutes are taken between decompression stops and the time is included in the time of the next stop.
4. Time at maximum pressure does not include the compression time.

*Shikanov (1973).

Depth (ft) (meters)		Time (hours)(min)	Breathing media	Total elapsed time (hours)(min)	
160	49	15	Air	20	
160-125	49-38	3	Air	23	
125	38	1	Air	24	
115	35	2	Air	26	
106	32	2	Air	28	
96	29	3	Air	31	
86	26	5	Air	36	
77	23	8	Air	44	
67	20	10	Air	54	
58	18	10	Air	1	4
51	16	15	Air	1	19
45	14	20	Air	1	39
38	12	30	Air	2	9
32	10	40	Air	2	49
26	8	1	Air	3	49
19	6	1	50	5	39
13	4	3	Air	8	39
6	2	4	30	13	9

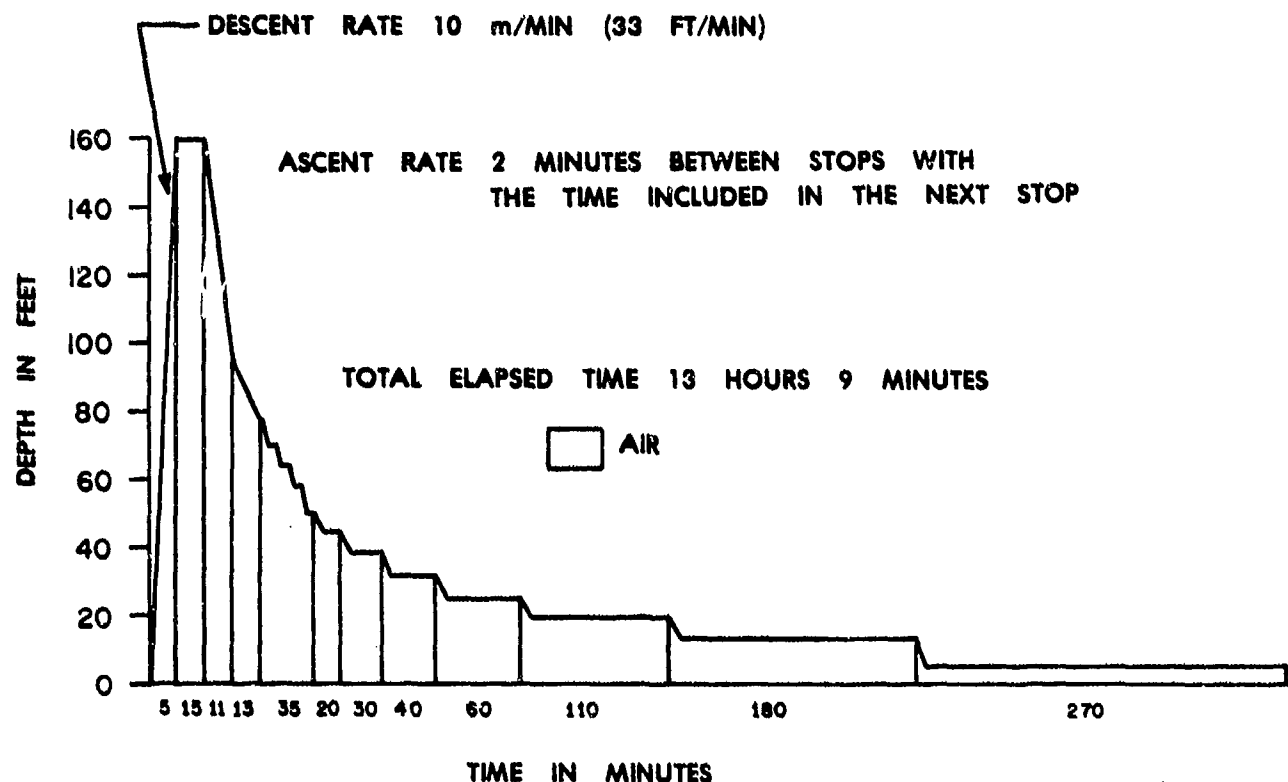


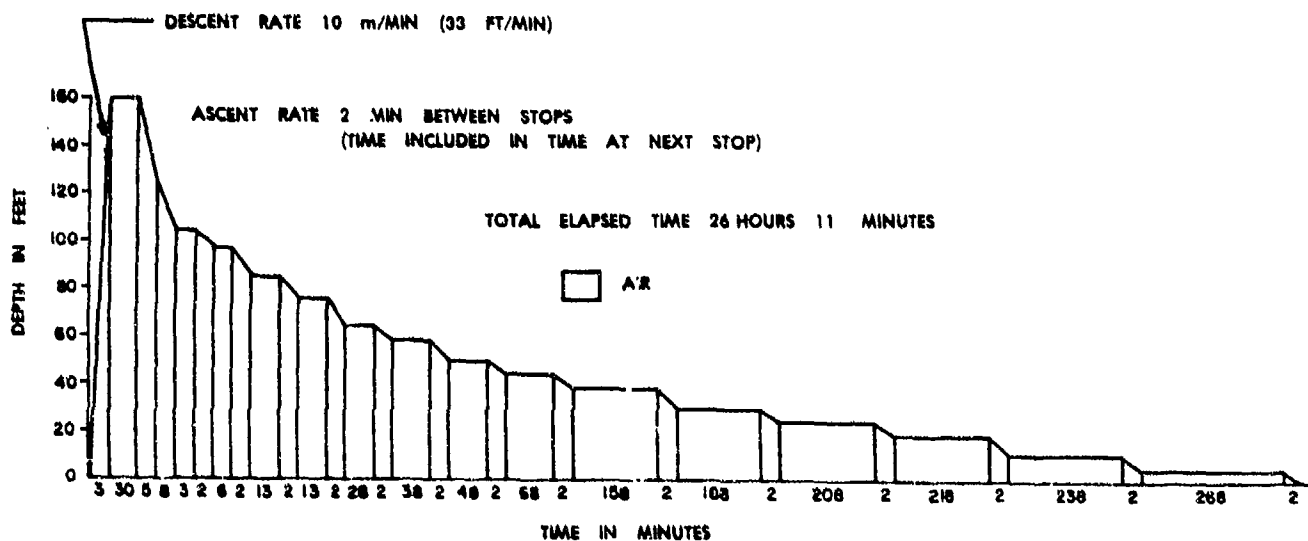
FIGURE 65

RUSSIAN THERAPEUTIC RECOMPRESSION REGIMEN II*

1. Use--treatment of light forms of decompression sickness in cases where the symptoms completely disappear upon reaching 160 feet. Regimen II is also used when there is a recurrence of symptoms while treating with Regimen I.
2. Descent rate--33 ft/min.
3. Ascent rate--1-2 minutes between decompression stops; the time is included in the time of the next stop.
4. Time at maximum pressure does not include the compressor time.

*Shikanov (1973).

Depth (ft)	Depth (meters)	Time (hours)(min)	Breathing media	Total elapsed time (hours)(min)
160	49	30	Air	35
160-125	49-38	5	Air	40
125	38	3	Air	43
115	35	3	Air	46
106	32	5	Air	51
96	29	8	Air	59
86	26	15	Air	1 14
77	23	15	Air	1 29
67	20	30	Air	1 59
58	18	40	Air	2 39
51	16	50	Air	3 29
45	14	1 10	Air	4 39
38	12	2 50	Air	7 19
32	10	3 10	Air	10 29
26	8	3 30	Air	13 59
19	6	3 40	Air	17 39
13	4	4	Air	21 39
6	2	4 30	Air	26 9
6-0	2-0	2	Air	26 11



RUSSIAN THERAPEUTIC RECOMPRESSION REGIMEN III*

1. Use--treatment of decompression sickness of medium severity (persistent pains in the joints and muscular pains without expressed disturbances of the motor function of the extremities, significant quickening of the pulse and respiration, etc.). Also use Regimen III when there is a recurrence of symptoms while treating with Regimen II.
2. Descent rate--33 ft/min.
3. Ascent rate--1-2 minutes between decompression stops; the time is included in the time of the next stop.
4. Time at the maximum pressure does not include the compression time.

*Shikanov (1973).

Depth		Time		Breathing media	Total elapsed time	
(ft)	(meters)	(hours)	(min)		(hours)	(min)
224	68		30	Air		37
224-173	68-53		5	Air		42
173	53		3	Air		45
163	50		3	Air		48
154	47		3	Air		51
144	44		3	Air		54
134	41		5	Air		59
125	38		5	Air	1	4
115	35		10	Air	1	14
106	32		15	Air	1	29
96	29		20	Air	1	49
86	26		25	Air	2	14
77	23		40	Air	2	54
67	20	1	0	Air	3	54
58	18	1	10	Air	5	4
51	16	1	50	Air	6	54
45	14	2	40	Air	9	34
38	12	3	0	Air	12	34
32	10	3	10	Air	15	44
26	8	3	30	Air	19	14
19	6	3	40	Air	22	54
13	4	4	0	Air	26	54
6	2	4	30	Air	31	24
6-0	2-0		2	Air	31	26

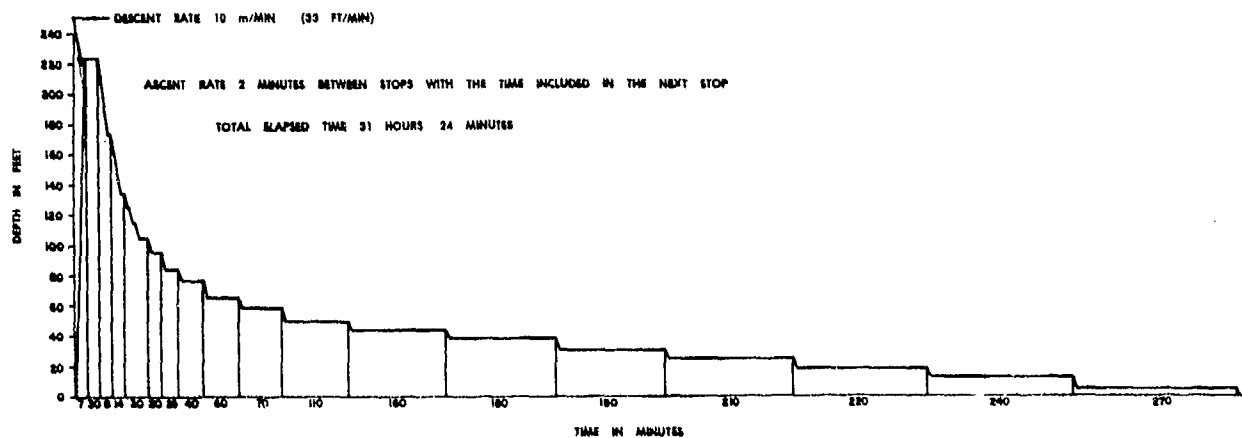


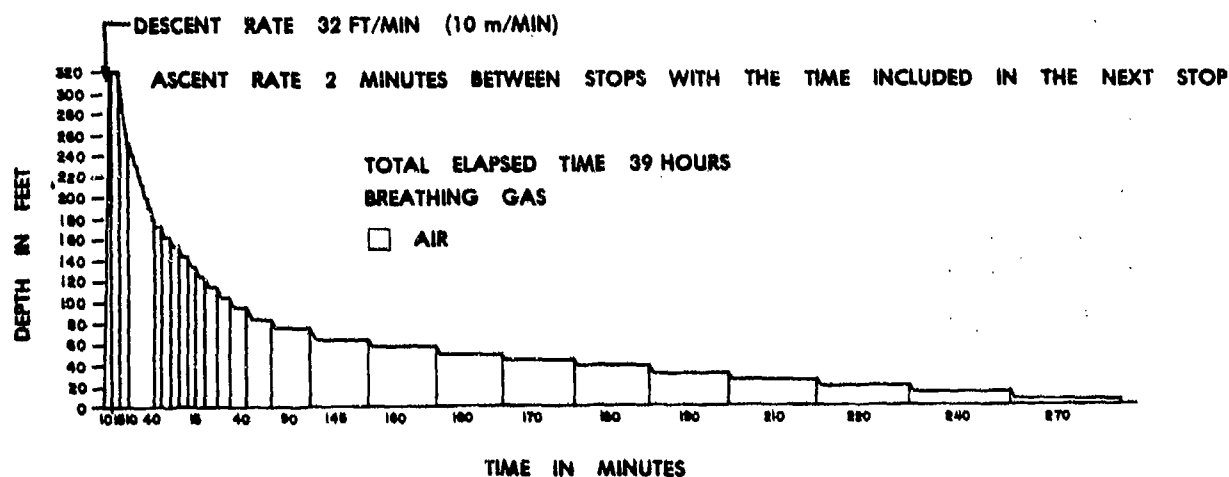
FIGURE 67

RUSSIAN THERAPEUTIC RECOMPRESSION REGIMEN IV*

1. Use--treatment of severe forms of decompression sickness (loss of consciousness, paresis and paralysis, disturbances of the activity of the cardiovascular system and respiration). Also use Regimen IV when there is a recurrence of symptoms while treating with Regimen III.
2. Descent rate--32 ft/min.
3. Ascent rate--1-2 minutes between decompression stops; the time is included in the time of the next stop.
4. Time at the maximum pressure does not include the compression time.

*Shikanov (1973).

Depth (ft) (meters)		Time (hours)(min)		Breathing media	Total elapsed time (hours)(min)
320	97	15		Air	25
320-249	97-76	10		Air	35
249	76	5		Air	40
240	73	5		Air	45
230	70	5		Air	50
221	67	5		Air	55
211	64	5		Air	1 0
201	61	5		Air	1 5
192	58	5		Air	1 10
182	56	5		Air	1 15
173	53	10		Air	1 25
163	50	10		Air	1 35
154	47	10		Air	1 45
144	44	10		Air	1 55
134	41	15		Air	2 10
125	38	15		Air	2 30
115	35	20		Air	2 55
106	32	30		Air	3 25
96	29	40		Air	4 5
86	26	1 0		Air	5 5
77	23	1 30		Air	6 35
67	20	2 25		Air	9 0
58	18	2 40		Air	11 40
51	16	2 40		Air	14 20
45	14	2 50		Air	17 10
38	12	3 0		Air	20 10
32	10	3 10		Air	23 20
26	8	3 30		Air	26 50
19	6	3 40		Air	30 30
13	4	4 0		Air	34 30
6	2	4 30		Air	39 0
6-0	2-0	2		Air	39 2



RUSSIAN THERAPEUTIC RECOMPRESSION REGIMEN V*

1. Use--treatment of especially severe forms of decompression sickness involving severe disturbances of the activity of the central nervous system, the cardiovascular system, and the respiratory system where no relief is obtained within 15 minutes at 320 ft. Also use Regimen V when there is a recurrence of symptoms while treating with Regimen IV.
2. Descent rate--32 ft/min.
3. Ascent rate--1-2 minutes between decompression stops; the time is included in the time of the next stop.
4. Time at the maximum pressure does not include the compression time.
5. Regimen V can be used with either air or helium-nitrogen-oxygen. When the latter is used, the chamber is compressed with air to 224 ft; the remainder of the compression to 320 ft is done with pure helium.

*Shikanov (1973).

Depth (ft) (meters)		Time (hours)(min)		Breathing media	Total elapsed time (hours)(min)	
320	97	1	0	Air or He-N ₂ -O ₂	1	10
320-259	97-79		15		1	25
259	79		20		1	45
249	76		25		2	10
240	73		30		2	40
230	70		35		3	15
221	67		40		3	55
211	64		50		4	45
201	61	1	0		5	45
192	58	1	10		6	55
182	56	1	30		8	25
173	53	1	40		10	5
163	50	2	0		12	5
154	47	2	10		14	15
144	44	2	30		16	45
134	41	2	40		19	25
125	38	3	0		22	25
115	35	3	0		25	25
106	32	3	20		28	45
96	29	3	20		32	5
86	26	4	10		36	15
77	23	5	0		41	15
67	20	5	0		46	15
58	18	4	10		50	25
51	16	4	10		54	35
45	14	4	30		59	5
38	12	4	30		63	35
32	10	4	30		68	5
26	8	4	30		72	35
19	6	4	30		77	5
13	4	5	0		82	5
6	2	5	0		87	5
6-0	2-0		2		87	7

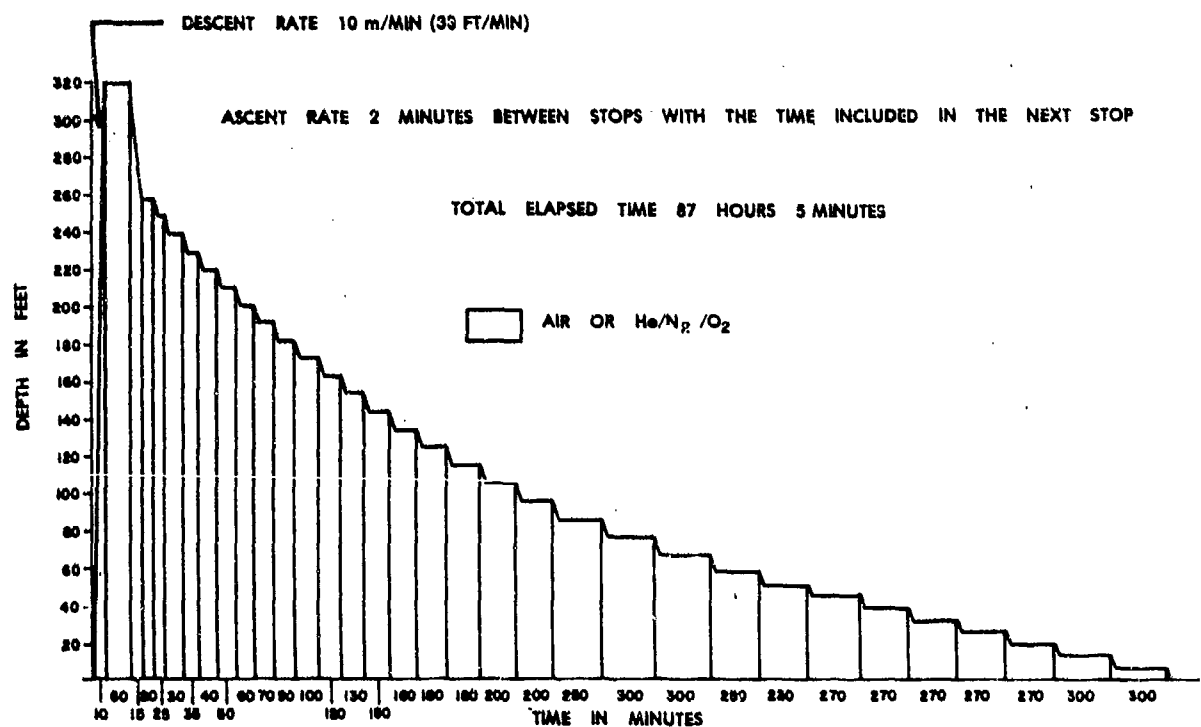


FIGURE 69

GERMAN SHORT AIR RECOMPRESSION TREATMENT TABLE USED
DURING THE RENDSBURG PEDESTRIAN TUNNEL PROJECT*

1. Use--treatment of mild cases of decompression sickness when relief is obtained within 30 minutes at 98 feet (30 meters).
2. Descent rate--assumed to be 10 m/min.
3. Ascent rate--as shown in the table listed.
4. Time at treatment depth does not include the compression time.

Depth (ft) (meters)		Time (min)	Breathing media	Total elapsed time (hours)(min)	
98	30	30	Air		33
98-30	30-9	5.5	Air		38.5
30	9	30	Air	1	8.5
30-20	9-6	3	Air	1	11.5
20	6	30	Air	1	41.5
20-10	6-3	3	Air	1	44.5
10	3	30	Air	2	14.5
10-0	3-0	3	Air	2	17.5

*Munsche, Hartmann, and Fust (1964).

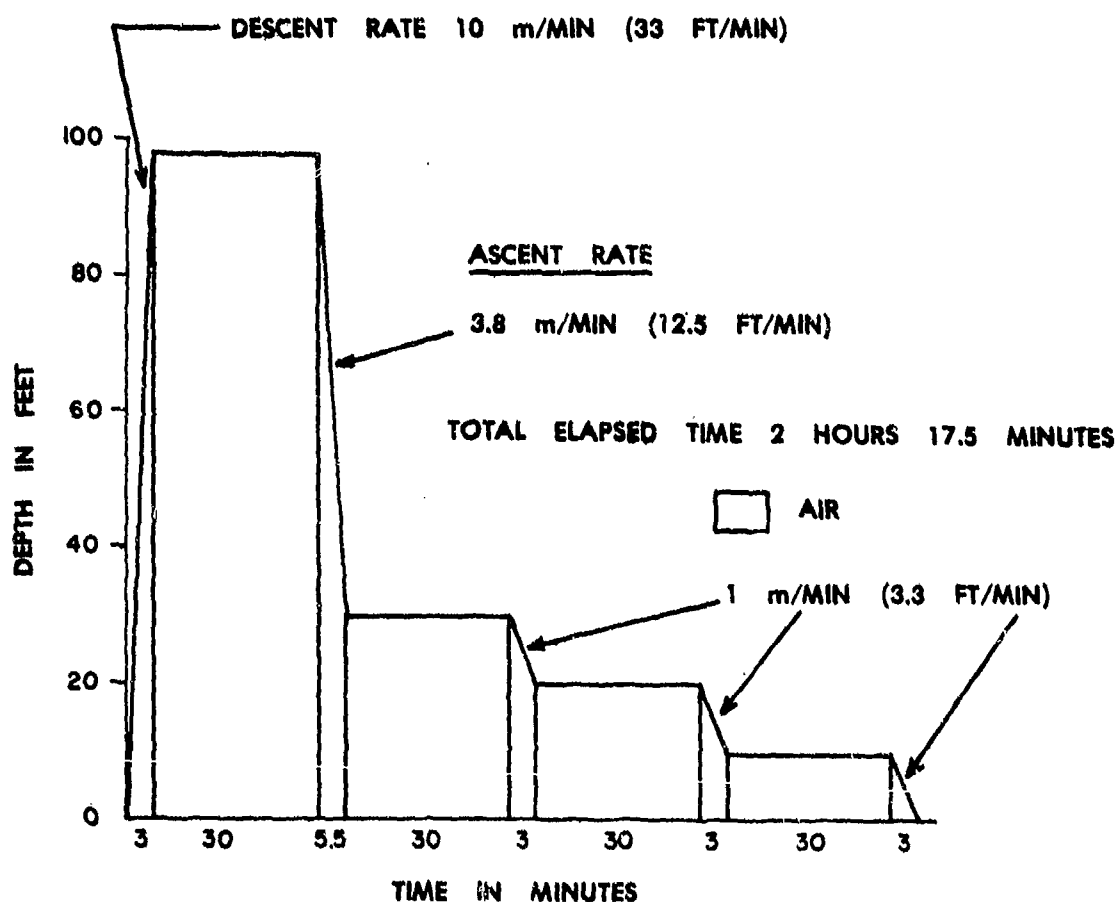


FIGURE 72

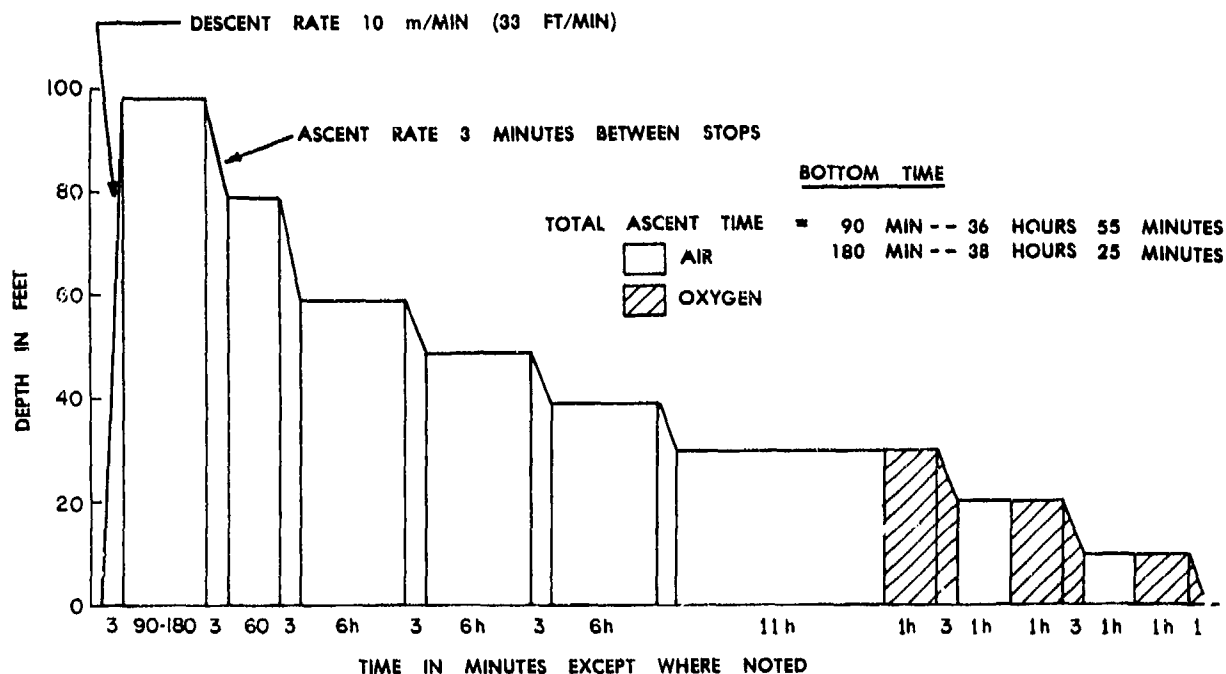
GERMAN RECOMPRESSION TREATMENT TABLE USED
DURING THE RENDSBURG PEDESTRIAN TUNNEL PROJECT*

1. Use--treatment of severe decompression sickness when relief is not obtained within 30 minutes at 98 feet.

	Depth		Time (hours)(min)	Breathing media	Total** elapsed time			
	(ft)	(meters)			(hours)(min)	(hours)(min)	(hours)(min)	(hours)(min)
2. Descent rate--assumed to be 10 m/min.	98	30	90-180	Air	1	33	3	3
	79	24	1	Air	2	36	4	6
3. Ascent rate--3 minutes between stops.	59	18	6	Air	8	39	10	9
	49	15	6	Air	14	42	16	12
4. Time at 98 ft (30 m) does not include the compression time.	39	12	6	Air	20	45	22	15
	30	9	11	Air	31	48	33	18
	30	9	1	Oxygen	32	48	34	18
	20	6	1	Air	33	51	35	21
	20	6	1	Oxygen	34	51	36	21
	10	3	1	Air	35	54	37	24
	10	3	1	Oxygen	36	54	38	24
	10-0	3-0	1	Oxygen	36	55	38	25

*Wunsche, Hartmann, and Fust (1964).

** Total elapsed time depends upon time spent at maximum pressure.



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