Medical experience with therapeutic abortion following the institution in 1967 of a liberalized abortion law in California is presented in terms of morbidity and mortality. Septic abortion and maternal mortality have decreased as a result. Morbidity in legal abortions is still a problem due primarily to gestational age. Other factors also involved are discussed, and the social and medical implications are indicated.

Trends in Therapeutic Abortion in San Francisco

Phillip Goldstein, M.D. and Gary Stewart, M.D.

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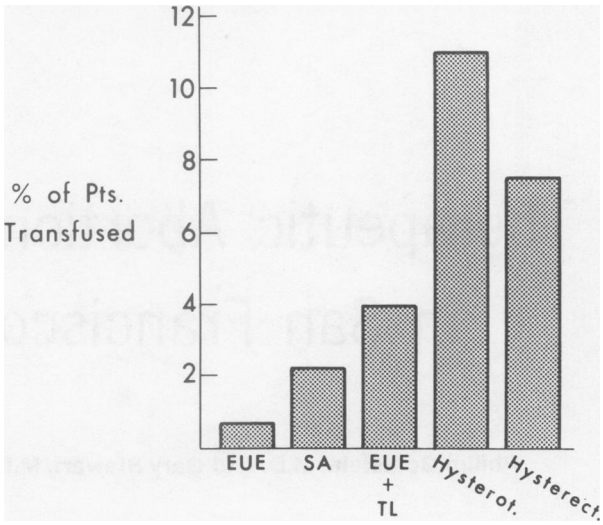
When one entitles a paper "Trends in Therapeutic Abortion," he steps immediately into a suit, not of armor, though this type of apparel concerning the legal abortion topic is necessary in some communities, but rather he steps into a suit of bias and prejudice. The prejudice is determined by what "cross" he wishes to bear, by his background, by his livelihood and, of course, by peer approval. Abortion is not any longer a scientific word, a medical term, which describes the act of conception completion before the time of viability. Abortion is rather an emotional experience for some individuals, if not for all. This procedure has acquired political, economic, societal, and of course legal overtones of immense proportions. Reams of paper and libraries of verbiage have been produced in its favor and similar emissions have appeared in opposition. My purpose then, in trying to avoid inflicting personal prejudices will be to discuss some significant events concerning legal abortion from a positive position and some of equal significance from a negative point of view.

California instituted a liberalized abortion law in 1967 after bitter debate and argument in its legislative bodies. The law allows the performance of legal abortion for rape, incest, statutory rape, and pregnancy which may result in significant impairment of maternal health, either physical or mental. There is no provision for abortion for fetal reasons. The last legal point of pregnancy termination seems to be 22 weeks although by convention, at least in San Francisco, 20 weeks is the outside limit of gestational age especially if the uterine size correlates well with dates. Parenthetically, the use of diagnostic techniques such as ultrasound permits an increased amount of confidence in predicting fetal age in borderline cases. When one attempts to elicit parameters with which to evaluate this liberalized law, a physician would surely use maternal mortality and morbidity as a reasonable starting point. In California, the major single cause of maternal mortality has been related to abortion. The specific causes of morbidity and mortality have been hemorrhage and infection. Dr. Stewart and I culled statewide as well as local statistics to evaluate this problem. At San Francisco General Hospital, the city and county hospital into which most septic abortions are funneled, a marked decline in septic abortions has occurred. This decline is directly parallel to the institution of legal abortion. In 1967, which was a representative year, and in which no legal abortions were performed at this hospital, the septic abortion rate was 68 per 1,000 live births. In 1968, there were only 36 septic abortions per 1,000 live births and in 1969 there were only 22 septic abortions per 1,000 live births.[1] We also noted a concomitant decrease at our hospital in so-called spontaneous abortions and in reviewing the records of private hospital admissions found a corresponding fall in spontaneous abortions from 125 per 1,000 in 1967 to 49 per 1,000 in 1969. Clearly then, there has been a fall in criminal abortions; both in septic abortions which represent only the "tip of the iceberg" and in spontaneous abortions many of which were in fact, not all that spontaneous. The impact on the illegal abortionist has been significant. It may be safely assumed, though impossible to prove, that an illegal abortionist requires a profit to overcome the potential hazard of incarceration and/or fine, so with a declining clientele, they will likely not be very active.

In concert with the observed decrease in septic abortion admissions, maternal mortality in California also decreased. Maternal deaths due to abortion fell from 8 per 100,000 to just over 3 per 100,000 from 1967 to 1969, a trend more marked in the Bay Area during this time period than in the Los Angeles area, where rapid implementation of the legal abortion act had not been employed.[2] Dr. Rovinsky, writing in Obstetrics and Gynecology in September 1971[3] duplicates our original work. He finds the maternal death rate for New York since the liberalization of abortion in the city to be markedly diminished to only 2 per 100,000 from October 1970 to February of 1971.

In evaluating the demographic characteristics of the women aborted in the Bay Area, I would like to share with you some negative findings. First, some general facts. The two major surgical procedures employed for legal abortion are vacuum aspiration with or without dilatation and curettage, utilized for pregnancies of 12 weeks duration or less. The second common procedure is the instillation of 20% saline solution into the uterus at 15 weeks or more. The total overall morbidity of saline abortion as compared to early abortion is much greater. (Table 1) Indeed, the only Bay Area death associated with legal abortion in our series occurred as a complication of a saline abortion in a 16-year-old girl. The saline abortion, for instance, required a second admission in 5.7% of cases. Fifty per cent of these readmissions were for unsuccessful abortions. Repeat saline instillation was successfully performed in most of these. It is to be

Figure 1—Rate of Blood Transfusion/Procedure



noted that emergency evacuation of the post-saline aborted patient was attended by a phenomenal 10% uterine perforation rate. By contrast early abortions had secondary hospital admissions in only 1.2% of all patients and these were predominantly because of infection, not requiring surgery.

The incidence of transfusion in saline abortions is 2.3%, a threefold increase over early abortion. (Figure 1) Of importance is the inability to accurately assess blood loss with saline abortion. This necessitates prolonged recovery in a patient that may be considered to be "uncomplicated." The review of records noted significant hemorrhage in only 4% of saline abortions, (Table 1) clearly a low figure compared to the 2.3% transfusion rate.

Delay in the performance of any type of abortion, even when the abortion is performed by the less morbid uterine evacuation procedure, is associated with progressively increasing hemorrhage and infection. The incidence of hemorrhage and infection was 2.7% at 5-6 weeks of gestation and 12.9% at 11-12 weeks gestation. (Figure 2) This represents a fivefold increase in morbidity between abortions performed shortly after the first missed period as opposed to abortions performed after the third missed period by this technique. The data of the Joint Program for the Study of Abortion (JPSA) as reported by Dr. Tietze at the American Association of Planned Parenthood Physicians in April of this year corroborates these findings, although perhaps not as dramatically. He found a twofold increase in the total complication rate in early vs. late suction abortions. It is interesting to note at this point that both we and Dr. Tietze found little difference in morbidity of saline abortion at 15 weeks when compared to 20 weeks.[4]

Infection was more common in saline abortion. The frequency of infection as manifested by fever greater than

Figure 2—E.U.E.: Combined Morbidity (Table VII) and Stage of Gestation

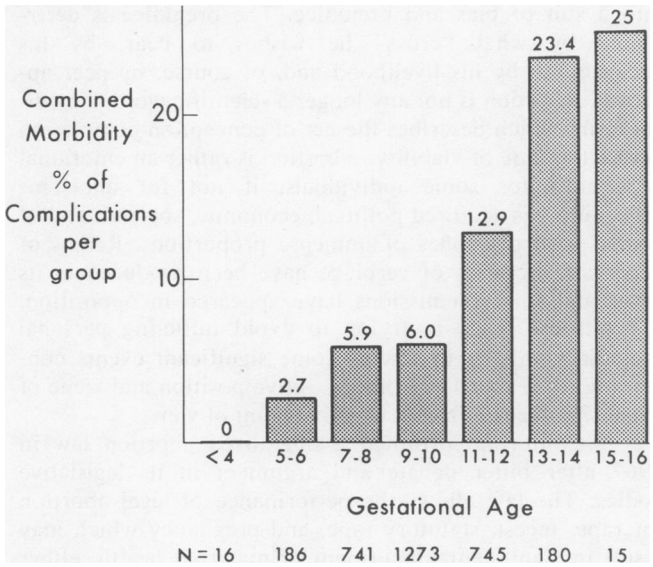


Table 1—Complication Rate of Legal Abortion by Type of Procedure

Type of Procedure	Blood Loss	Febrile	Retained P.O.C.	Second Procedure	Second Hosp.	N
		Complication				
EUE	5%	2% (0.1)	0.2%	1%	1.2%	3482
EUE & T.L.	26%	18% (8.1)	0%	1.4%	1.4%	112
SA	4%	9% (1.5)	7.5%	9.5%	5.7%	1143
Hysterotomy	31%	42% (13	0%	0%	0%	69
Hysterectomy	27%	39% (22)	0%	2%	0%	67

( ) *Definition by ACOG*

Table 2—Procedure: Service

Service	EUE	EUE & T.L.	SA	Hysterotomy	Hysterectomy	N
Ward	62%	3.5	30.0	1.9	2.0	1451
Private	71%	1.7	24.7	1.2	0.9	3386

100.4 for greater than 12 hours, the presence of uterine or parametrial tenderness or both, occurred 10 times more often in saline abortion than in early uterine evacuation, (Table 1) a difference shown also by Tietze and Rovinsky of roughly seven and threefold respectively. The differences in magnitude may be on the basis of diagnosis since Dr. Rovinsky does not elucidate his parameters of endometritis.

It is clear then that delay in abortion is attended by a marked increase in morbidity. The total morbidity must be assumed to be even greater than reported. We do not have adequate conclusive data, but again JPSA does. The average total morbidity was 2% higher in local follow-up patients as compared to the total.

It is therefore of some interest that where 63% of abortions were of the early evacuation variety and 28% were of the saline type in 1968, 74% were by suction and only 22% were by saline in 1970. (Figure 3) Clearly a trend in the right direction.

A word about other forms of abortion and operations associated with abortion, primarily sterilization procedures. Hysterotomy plus tubal ligation and hysterectomy were attended by hemorrhage rates of 31% and 27% and by infection rates of 13% and 22% respectively. (Table 1) They are clearly much more traumatic than other forms of abortion. Suction abortion plus vaginal tubal ligation was attended by a hemorrhage rate of 26% and an infection rate of 8%. All of these procedures have declined in popularity from 1968 through 1970 and at present represent only 4% of all abortions.

The patients evaluated ranged in age from 13 to 45 with the mean being 20-24 years of age. (Figure 4) Approximately half the patients had never been pregnant. There were three times more abortions performed on so-called private patients than service or ward patients. (Table 2) The ethnic distribution was surprisingly close to the ethnic makeup of the hospital traditionally serving the community, except in the San Francisco General Hospital, where a large Spanish-speaking population utilized the delivery service, but not the abortion service. This is emphasized by the fact that of more than 7,900 abortions done in San Francisco in 1970, only 500 were to patients with Latin surnames, 6%. Spanish-speaking people are estimated, however, to be 14% of the population of San Francisco.

We have shown the increasing morbidity of advancing gestation on the procedure of abortion. We have shown the remarkable morbidity associated with sterilization and abortion. Some observations then, on the population subjected to these procedures.

The patient 19 years of age and younger in our study accounted for 26% of all abortion candidates. (Figure 4) They account for 18.2% of the New York study and represent 23% of the JPSA, Tietze study. Thirty seven per cent of teenage abortions done in our group were by saline injection technique as compared to 24% of the total group. More than 30% of teen patients in Rovinsky's study and similarly more than 30% of Tietze's study were seen after 15 weeks also, practically guaranteeing their subjection to a saline abortion.

Figure 3—Percentage Comparisons by Type of Abortion: 1968-70

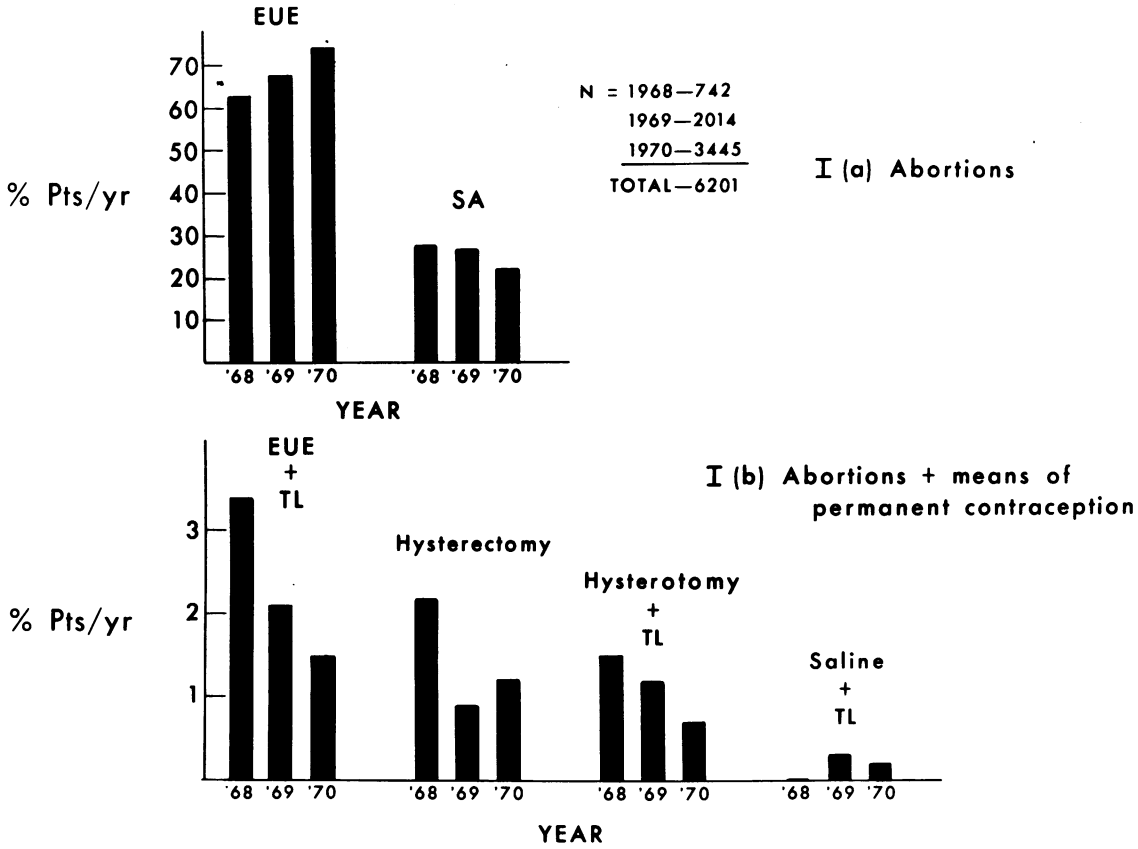
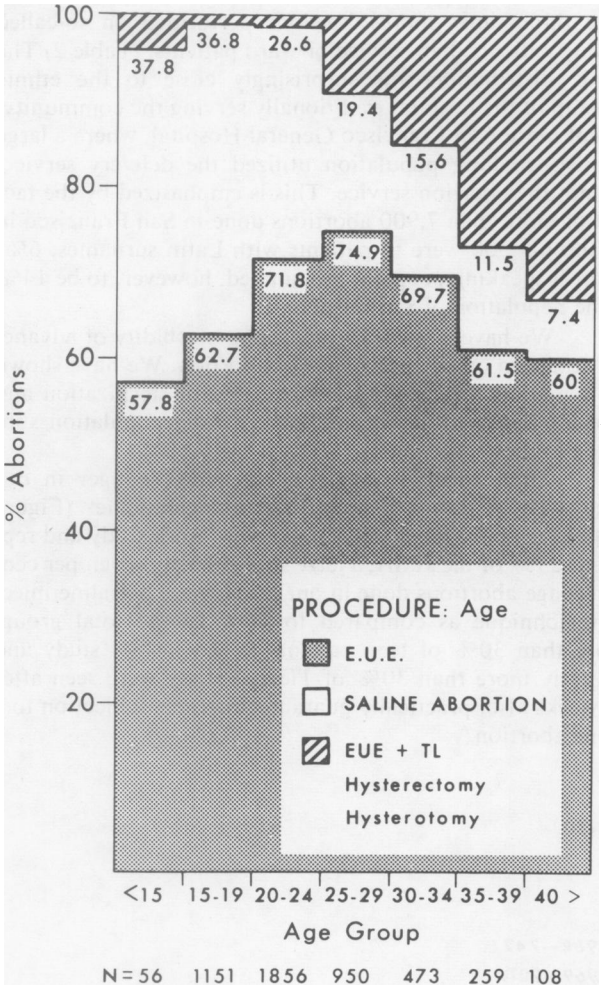


Figure 4—Age of Patients in Relation to Abortions Performed



Rovinsky showed a 31.4% incidence of gestations between 13-20 weeks at the municipal hospitals as compared to a 20% rate of 13-20 week patients at proprietary hospitals. Tietze does not break this down, but if one allows the reasonable assumption that blacks are generally poorer than whites in this country and more likely to be served by municipal and service centers, it is noted that 33% of blacks were seen after 14 weeks of gestation compared to only 20% of whites.

The pattern then is clear. We note a twofold increase in hysterectomy as primary procedure with the ward patient (2.0% vs. 0.9%). (Table 2) We also note the ward patient has been sterilized by tubal ligation twice as often as the private patient in conjunction with suction abortion, 3.5% to 1.7%. We believe these figures indicate several facts. First, teenagers and indigents are entering abortion services later than their sisters. They are therefore subjected to procedures fraught with ever increasing morbidity; hemorrhage, infection, and readmissions. The latter is of some interest (Table 3) since readmission to ward services are often via emergency rooms manned by unfamiliar personnel, thereby once again invoking delay in diagnosis and treatment. The private patient by alerting her physician

Table 3—Indication for Readmission by Rank Order

Type of Procedure			
	EUE	**Saline**	
Incomplete AB	13	Unsuccessful AB	43
Endoparametritis	9	Incomplete AB	13
Endometritis	6	Endometritis	9
Psychiatric	3	Endoparametritis	8
Unsuccessful	4	Psychiatric	1
Thrombophlebitis	0	Thrombophlebitis	2
Other	8	Other	5
Total No. *45	(1.6%)	No. *73	(7.9%)

** = Patients, not number of complications.*

can more often meet a complication crisis by prompt specific services.

The obstructions to early abortion need to be removed to insure equal opportunity for all. The need for a psychiatrist's approval for abortion is ridiculous, especially in view of the lack of follow-up for the unusual patient who might benefit from psychiatric help. To therefore humiliate a patient by suggestions that she see a psychiatrist, thereby implying she is unbalanced in seeking an abortion, is doubly obstructing in that she may delay seeking help, knowing of this legal provision, but also may experience some delays in obtaining an appointment and having the information put in the chart. Administrative delays such as we have in California involving prior authorization of state health insurance is likewise obstructive. The cost factor is still a major obstruction to some individuals.

The morbidity of abortion does not end with fever and bleeding. The long-term effects of abortion are essentially unknown in this country. We have some inferences from other countries. Jurukovski, writing in the May 1971 International Journal of Gynecology and Obstetrics, reports an increase in postabortal pregnancy complications such as placenta previa and abruptio placenta in Czechoslovakia.[5] Klinger in the same journal, September 1970, reports a progressive increase in premature births to women with multiple induced abortions, from a 10% prematurity rate among non-aborted patients to a 24% prematurity rate among women having three or more induced abortions.[6] The same author reports an overall increase in prematurity, 50% of which he ascribes to abortion. He, in turn, then describes a corroborative Japanese survey. Yet another obvious long-term consequence of abortion is associated with perforation of the pregnant uterus. This complication occurred in about 1/200 abortions in our series as well as in Tietze's, somewhat higher in Rovinsky's series. I include perforation under long-term complications because 50% of the perforated uteri in our series were removed. To the women who were pregnant as a failure of education regarding contraception, we feel that as a particularly poignant tragedy. Permanent loss of fertility seems a high price to pay for ignorance.

The greater good is to be gained in viewing abortion for what it is—a poor, very poor method of remedying a failure of contraception. And generally, failure of con-

traception is a failure of education, just as surely as delay in seeking advice and help to obtain an abortion is a failure of education.

To sum up then, the experience of which I speak seems to indicate that the operation of abortion carries with it a significant morbidity based primarily on gestational age. The more morbid procedures, i.e., coexistent sterilization, and saline infusion are decreasing in popularity indicating increasing patient education, and removal of administrative obstacles, implementation of innovative techniques and wider medical service availability. There are still a few isolated groups of patients for whom abortion is a late alternative to pregnancy and delivery and these would seem to be the younger patient and the indigent patient. We urge that the legalization of abortion therefore not be the end unto itself, but rather a surgical procedure seeking its own eradication through increased awareness of the need for sex education, counseling and contraceptive practice.

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Errata

In the February (Vol. 62, No. 2) issue of the Journal there was an error in the article "A Standard Recording and Reporting System for Smoking Withdrawal Research" by Raymond J. Corsini, Ph.D. Table 1 was incomplete. The Interpretation of the Data that should have appeared with Table 1 was incorrectly placed at the end of the Summary on p. 163.

In the March (Vol. 62, No. 3) issue of the Journal there was an error in the article "The Outcomes and Service Impact of a Pediatric Nurse Practitioner Training Program" by Alfred Yankauer, M.D., et al. Figures 1 and 2 and their headings are misplaced. The Figure 1 heading is correctly placed (p. 348), but its figure appears under the Figure 2 heading (p. 350) and vice versa.