FINAL REPORT

PART B

1. Title of Project:

END OF LIFE DECISION MAKING AND LIFE ENDING PROCEDURES IN EUROPEAN INTENSIVE CARE UNITS

Project Acronym: ETHICUS

2. Contact Number: PL 963733

3. Official Contract Period: June 1, 1998 – May 31, 2001

4. Coordinator:

UNITED KINGDOM

Name:	Dr. Simon Cohen (Country Coordinator)
Organization:	University College London
Postal address:	Department of Medicine, University College London 5, University Street, London WC1E 6JJ UK
Telephone:	44 207 388 3894
Telefax:	44 207 209 6211, 171 207 9816
E-mail:	Simon.cohen@ucl.ac.uk

5. Participants:

AUSTRIA

Name:	Dr Wolfgang Schobersberger (Country Coordinator)
Organization:	University of Innsbruck
Postal address:	Division of General and Surgical Intensive Care Medicine Clinic for Anaesthesia and Intensive Care Medicine University of Innsbruck, Anichstrasse 35 A-6020 Innsbruck
Telephone:	43 512 504 4560
Telefax:	43 512 504 2749
E-mail:	Wolfgang.schobersberger@uibk.ac.at

BELGIUM

Name:	Prof. Maurice Lamy (Country Coordinator)
Organization:	University of Liege
Postal address:	Chairman, Dept. of Anesthesiology and ICU University of Liege, CHU Domaine Universitaire du Sart Tilman B-35 - B 4000 Liege 1
Telephone:	32 41 3667179
Telefax:	32 41 3667636
E-mail:	Mlamy@chu.ulg.ac.be

Name: Prof. Peter Lauwers
Organization: University Hospital Gasthuisberg, Cathol. University Leuven
Postal address: Department of Intensive Care Medicine
University Hospital Gasthuisberg, Cathol. University Leuven
Herestraat 49, 3000 Leuven
Telephone: 32 16 34 40 21 (Dept)
Telefax: 32 16 34 40 15
E-mail: Pieter.wouters@uz.kuleuven.ac.be

CZECH REPUBLIC

Name: Dr Ivan Novak (Country Coordinator)
Organization: Charles University Hospital
Postal address: 1st Medical Department, Charles University Hospital
Alej Svobody 80, 30460 Pilsen CZECH REPUBLIC
Telephone: 420 19 710 3200/165
Telefax: 420 19 522 566
E-mail: Novaki@fnplzen.cz

Name: Dr Daniel Nalos
Organization: Aro Masarykova Nemonice
Postal address: Aro Masarykova Nemonice
Patachova 17, 401 31 usti n/labem
Telephone: 420 47 56 82 200
Telefax: 420 47 52 11 735
E-mail: Nalosd@post.cz

DENMARK

Name: Anne Lippert, M.D. (Country Coordinator)
Organization: Herlev University Hospital
Postal address: Department of Anesthesiology
Herlev University Hospital, Herlev Ringvej 75
DK 2730 Herlev
Telephone: 45 44 88 3839
Telefax: 45 44 53 4806
E-mail: Lippert@dadlnet.dk

Name: Hans-Henrik Bulow
Organization: Glostrup University Hospital
Postal address: Senior registrar
Department of Anaesthesiology and Intensive Care Y 23,
Glostrup University Hospital, Ndr. Ringvej,
DK 2600 Glostrup
Telephone: 45 4323 2300
Telefax: 45 4323 3986
E-mail: Hhbulow@dadlnet.dk

Name: Dr. Michael Wanscher, M.D.
Organization: Arhus University Hospital
Postal address: Department of Anaesthesiology
Arhus University Hospital
8200 Arhus N.
Telephone: 45 8949 5556
Telefax: 45 8949 6014

E-mail: Wanscher@dadlnet.dk

FINLAND

Name: Dr Seppo Hovilehto (Country Coordinator(
Organization: South Karelia Central Hospital
Postal address: Head, Department of Intensive Care
South Karelia Central Hospital
Valto Kakelankatu 1
53130 Lappeenranta
Telephone: 358 5 611 815753
Telefax: 358 5 611 5747
E-mail: Seppo.hovilehto@ekshp.fi

GERMANY

Name: Prof. Dr Karl Werdan (Country Coordinator)
Organization: Martin Luther-University
Postal address: Martin Luther-University, Halle-Wittenberg
Medizinische Fakultaet
Zentrum fuer Innere Medizin III
Klinikum Kroellwitz, Ernst-Grube-Str. 40
D-06097 Halle (Salle)
Telephone: 49 345 557 2621
Telefax: 49 345 557 2072
E-mail: karl.werdan@medizin.uni-halle.de

Name: Prof. Konrad Reinhart
Organization: Friedrich-Schiller Universitat
Postal address: Klinik fur Anasthesiologie und Intensivtherapie
Friedrich-Schiller Universitat
Bachstrasse 18, D-07740 Jena
Telephone: 49 3641 933041
Telefax: 49 3041 933256
E-mail: reinhart@anae1.med.uni-jena.de

GREECE

Name: Prof. Apostolos Armaganidis M.D. (Country Coordinator)
Organization: Evangelismos Hoapital
Postal address: Critical Care Department, Evangelismos Hoapital
45-47 Ipsilandou str.
10675 Athens
Telephone: 30 1 724 3320
Telefax: 30 1 721 6503/724 4941
E-mail: aarmag@atlas.uoa.gr

Name: Dr Nina Maguina
Organization: Agia Olga Hospital of Nea Ionia
Postal address: Intensive Care Unit Director
Agia Olga Hospital of Nea Ionia,
Konstantopouleion Hospital,
2, Aghia Olga Street, Nea Ionia, Athens
Telephone: 30 1 271 0019
Telefax: 30 1 271 0019

Name:	Dr G Nakos
Organization:	University Hospital of Ionnina
Postal address:	Director, ICU, University Hospital of Ionnina Ionnina
Telephone:	30 651 46618
Telefax:	30 651 99353
Email:	gnakos@compulink.gr

IRELAND

Name:	Dr Dermot Phelan (Country Coordinator)
Organization:	Mater Misericordiae Hospital
Postal address:	Department of Anaesthesia and Intensive Care Mater Misericordiae Hospital Eccles Street, Dublin 7
Telephone:	353 1 830 18 20
Telefax:	353 1 830 78 67
E-mail:	dphelan@mater.ie

ISRAEL

Name:	Prof. Charles L. Sprung, M.D., J.D. (Study Scientific Coordinator, Country Coordinator(
Organization:	Hadassah Medical Organization
Postal address:	Director, General Intensive Care Unit Department of Anesthesiology Hadassah Medical Organization P.O.B. 12000, Jerusalem 91120
Telephone:	972 2 677 8060
Telefax:	972 2 643 0349
E-mail:	sprung@cc.huji.ac.il

Name:	Dr. Allan Fisher
Organization:	Soroka Hospital
Postal address:	Intensive Care Unit Soroka Hospital P O Box 151 Beer Sheva, 84104
Telephone:	972 2 640 0727
Telefax:	972 2 627 8962
E-mail:	allan@bgumail.bgu.ac.il

Name:	Dr. Moshe Hersch
Organization:	Shaarei Zedek Medical Center
Postal address:	Director, General Intensive Care Unit Shaarei Zedek Medical Center P.O. Box 3225, Jerusalem 91031
Telephone:	972 2 655 5564
Telefax:	972 2 651 3936
E-mail:	hersch@szmc.org.il

ITALY

Name:	Giorgio Conti, M.D. (Country Coordinator)
Organization:	University of Rome “La Sapienza”
Postal address:	University of Rome “La Sapienza” Policlinico Umberto I

	Viale Del Policlinico 151, Rome 00161
Telephone:	3906 446 3101/2
Telefax:	3906 446 1967
E-mail:	contigio@uniroma1.it
Name:	Prof. Antonio Braschi
Organization:	Policlinico San Matteo
Postal address:	Rianimazione I Settore
	Policlinico San Matteo, 27100 Pavia
Telephone:	39 0382 503 477
Telefax:	39 0382 503 008
E-mail:	Anbra@tin.it

NETHERLANDS

Name:	Prof. L.G. Thijs, M.D. (Country Coordinator)
Organization:	VU Hospital
Postal address:	Director, Medical Intensive Care Unit
	VU Hospital, P. O. Box 7057
	NL-1007 MB Amsterdam
Telephone:	31 20 444 2342
Telefax:	31 20 444 2392
E-mail:	Lg.thijs@azvu.nl

PORTUGAL

Name:	Dr Paulo Maia (Country Coordinator)
Organization:	Hospital Geral de Santo Antonio
Postal address:	Servico de Cuidados Insensivos
	Hospital Geral de Santo Antonio
	Largo Prof. Abel Salazar, 4050 Porto
Telephone:	351 2 2077500 ext. 1342
Telefax:	351 2 2005511
E-mail:	nop18475@mail.telepac.pt
Name:	Dr. Leonardo Ferreira
Organization:	Hospital Pulido Valente
Postal address:	Unidade de Cuidados Intensivos Pneumologicos
	Hospital Pulido Valente
	Alameda das Linhas de Torres 117
	1769-001 Lisboa
Telephone:	351 1 754 8541
Telefax:	351 1 757 6050
E-mail:	Leonardo.ferreira@ip.pt
Name:	Dra Maria Emilia Duarte Oliveira
Organization:	U.C.I.P. – Hospital de S. Marcos
Postal address:	U.C.I.P. – Hospital de S. Marcos
	Apartado 2242, 4700 Braga
Telephone:	351 25 320 9175
Telefax:	351 53 601 3176
E-mail:	hosp.braga@mail.telepac.pt
Name:	Dr. Antonio Resina Rodrigues
Organization:	Hospital de S. Jose
Postal address:	Unidade de Urgencia Medica - Hospital de S. Jose

Rua Jose Antonio Serrano
1100 Lisboa
Telephone: 351 1 886 4616
Telefax: 351 1 884 1452
E-mail: RDS0078@mail.telepac.pt

SPAIN

Name: Jose F. Solsona (Country Coordinator)
Organization: Hospital del Mar
Postal address: Hospital del Mar
Paseo Maritimo 25-29
Barcelona 08003
Telephone: 34 93 2211010
Telefax: 34 93 343 2210541
E-mail: 13713@imas.imim.es

Name: Dr R Abizanda
Organization: Hospital General de Castello
Postal address: Hospital General de Castello
Medicina Intensiva
Avda. Benicassim s/n
12004 Castello
Telephone: 34 64 21 344204
Telefax: 34 64 252345
E-mail: net@ran.es

Name: Dr. Carmen Bouza
Organization: Hospital Gregorio Maradon
Postal address: Hospital Gregorio Maradon
Dr. Esquerdo 46
Madrid 28007
Telephone: 34 91 5868313
Telefax: 34 91 5868018
E-mail: Cbouza@apdo.com

SWEDEN

Name: Peter Sjokvist (Country Coordinator)
Organization: Huddinge University Hospital
Postal address: Department of Anaesthesia and Intensive Care
Huddinge University Hospital
Huddinge S-141 86
Telephone: 46-8-585 80 000
Telefax: 46-8-779 54 2
E-mail: Peter.Sjokvist@karo.ki.se

Name: Prof. Elisabeth Wennberg
Organization: Sahlgrenska Univesritetssjukhuset
Postal address: Sahlgrenska Univesritetssjukhuset
Sahlgrenska, CIVA/Postop
Avd 96, 413 45 Gothenburg
Telephone: 46 41 60 1000
Telefax: 46 31 41 4483
E-mail: Elisabet.wennberg@sahlgrenska.se

SWITZERLAND

Name:	Dr Bara Ricou (Country Coordinator)
Organization:	Hopital Cantonal Universitaire de Geneve
Postal address:	Medecin-Adjoint, Soins Intensifs de Chirurgie Hopital Cantonal Universitaire de Geneve Surgical Intensive Care Unit 24 Rue Micheli-du-Crest, 1211 Geneva 14
Telephone:	
Telefax:	00 41 22 382 7470
E-mail:	ricou-bara@diogenes.hcuge.ch

Name:	Dr R Malacrida
Organization:	Ospedale Regionale di Lugano
Postal address:	Ospedale Regionale di Lugano Capo-Servizio, Cure Intense interdisciplinari CH900 Lugano
Telephone:	91 805 61 41
Telefax:	91 805 61 42
E-mail:	Rmalacrida@tinet.ch

Name:	Prof. Dr med. R Ritz
Organization:	Kantosspital Basel
Postal address:	Leiter Abreilung Intensivmedizin Department Innere Medizin, Kantosspital Basel Universitatskliniken, CH4031 Basel
Telephone:	
Telefax:	
E-mail:	ritz@ubaclu.unibas.ch

TURKEY

Name:	Figen Esen, MD (Country Coordinator)
Organization:	University of Istanbul
Postal address:	Assoc. Professor, Dept of Anesthesiology & Intensive Care University of Istanbul Capa Klinikleri, 34390 Capa, Istanbul
Telephone:	90 212 631 8767
Telefax:	90 212 533 2083
E-mail:	Iureanim@escortnet.com

UNITED KINGDOM

Name:	Dr. Simon Cohen (Country Coordinator)
Organization:	University College London
Postal address:	Department of Medicine, University College London 5 University Street, London WC1E 6JJ UK
Telephone:	44 207 388 3894
Telefax:	44 207 209 6211, 171 207 9816
E-mail:	simon.cohen@medicine.ucl.ac.uk

Name:	Dr Charles Wallis
Organization:	Western General Infirmary
Postal address:	Intensive Care Unit

Western General Infirmary
Edinburgh, Scotland
Telephone: 44 131 537 1666
Telefax: 44 131 537 1021
E-mail: igrant@srv0.med.ed.ac.uk

Name: Dr. Tom Woodcock
Organization: Southampton General Hospital
Postal address: Consultant Anaesthetist, Intensive Care Unit
Southampton General Hospital
Tremona Road, Southampton SO16 6YD
Telephone: 01703 794 751
Telefax: 01703 794 753
E-mail: Woodcock@intonet.co.uk

Steering Committee:
C. Sprung, S. Cohen, L. Epstein, D. Miranda, F. Lemaire, G. Van Steendam.

6. Funding:

The EU contributed 83**%** of the resources for this project. Additional monies were provided, in part, by Grant No. 4226 from the Chief Scientist's Office of the Ministry of Health, Israel and, in part, by the European Society of Intensive Care Medicine. The other grants covered expenses that were not covered by the EU.

7. Background/rationale:

The ICU is the area in each hospital where the most critically ill patients are admitted. The ICU is characterized both by the concentration of sophisticated technological equipment and highly trained doctors and nurses. Life and death decisions, which are made daily in these units, have both an ethical and medical component. These decisions reflect the values and ethical norms of those involved in the decision-making, as well as those of the hospital and medical communities and the wider societies in which such communities operate.

Over the last several decades, there has been a change in the attitudes and practices at the end of life. Whereas most patients in the past in intensive care units (ICUs) died only after aggressive therapy, there has been a change in the manner in which patients now die. Increasingly, there has been a foregoing of life-sustaining treatments. End-of-life decisions have included withholding and withdrawing life-sustaining therapies and active euthanasia. Most studies of foregoing life-sustaining treatments have been theoretical discussions or reports of critical care professionals' attitudes concerning these issues. There have been no prospective studies comparing end-of-life decision-making in ICU patients in different countries with diverse cultural backgrounds and none throughout Europe.

Although the large majority of patients are discharged from the ICU and recover, many do not. This study focuses on patients for whom decisions were made, or not made, to limit or to actively shorten the dying process.

8. Overall Project Objectives

- To determine the ethical and medical bases for decisions at end of life in ICUs, specifically on withholding and withdrawing treatment in ICUs in Europe
- To investigate how these decisions are made, how and whether there is communication between patients, families, physicians and other staff in making these decisions
- To study which life-sustaining treatments are withheld or withdrawn and how this process takes place in the various countries

- To determine how well, or not, the principles of beneficence, non-maleficence, justice, autonomy, its limits, consent and refusal, substituted/surrogate consent, and the tension between medical and moral reflection are applied in the context of the different legal, ethical and religious climates in the various countries

9. Methodology

This was a multi-center study, conducted in 37 European intensive care units (ICUs) in 17 countries. The study commenced on June 1, 1998. Patients were enrolled from January 1, 1999 until June 30, 2001.

Prior to the enrollment of patients, a Coordination and Administrative Centre (CAC) was established and based in London. This centre worked closely with the European Society of Intensive Care Medicine (ESICM)'s Working Group on Ethics, together with the Steering Group for this project.

Country coordinators were identified. Each coordinator was requested to recruit three hospital ICUs in his/her country, with different patient populations (medical or surgical). Attempts were also made to recruit ICUs with different physician opinions concerning end of life decisions.

The CAC, Steering Group, Country Coordinators and ICU investigators and expert consultants developed the ethical problems involved and a consensus for definitions for end of life decisions. This was performed via frequent correspondence by email and telephone and meetings. The CAC, Steering Group, Country Coordinators and ICU investigators also developed the data format to be used in the study.

End of life categories included cardio-pulmonary resuscitation (CPR), brain death, withholding or withdrawing life sustaining therapies and active shortening of the dying process. The latter term was used instead of active euthanasia as it is more neutral and most patients were believed not be to able to request the action. In categorizing patients, the more extensive form of limitation was used if more than one occurred (withdrawing - if withholding and withdrawing, or shortening the dying process if withholding, withdrawing and shortening the dying process.) Patients with CPR had only CPR and those with brain death had only brain death. If a patient had CPR before withholding or withdrawing or brain death after withholding or withdrawing, the patient was categorized as withholding or withdrawing.

A workshop was organized prior to the study to assure that all participants were using the same, established end of life definitions for procedures and decisions. The data form was explained to all investigators. Sample patient forms, which had been developed, were distributed to investigators and subsequently analyzed to guarantee consistency in the responses between centres. Centres that did not conform were re-educated and sent subsequent sample patient forms. If they still failed to conform, they were dropped from the study.

To safeguard confidentiality and anonymity in the collection and handling of data, countries and institutions were given a code. No names were used in data collection.

Three levels of quality control (ICU level, Country Coordination level and the CAC level) were implemented to assess completeness and clinical judgement. Forms were tested for repeatability and found to have a correlation coefficient between 0.6 and 1.0.

This study was an observational study only. There was no patient treatment or intervention as part of the study. At each institution, there was Ethics Committee approval, with a waiver of informed consent. The entire ICU population was assessed at each participating center. Data were collected on the total number of patients admitted over the study period. Contemporaneously, data were collected on all patients who died in the ICU or had any limitation.

For each end of life decision, the following information was obtained:

1. Reasons for end of life decisions
2. Time of the decision
3. Type of provider making the decision
4. Ethnic /religious background of patient
5. Ethnic/religious background of decision maker
6. Degree of agreement in the decision between doctor, nurse, family, patient
7. Type of end of life decision
8. Treatments types limited at the end of life
9. Pain relief

Data were transmitted via a secure Internet site to the central processing unit in Israel.

Plenary sessions of country coordinators were held to discuss problems during the study. The internet site also included frequently asked questions with answers for all investigators to see to provide consistency. A meeting of country coordinators was held to review interim and final results.

Data were analyzed by the CAC together with the Scientific Research Team (SRT), led by the Israel Scientific Centre. Countries were divided into regions (Northern, Middle and Southern) based on geographic location prior to data analysis (Table 1).

Statistical analyses:

The main outcome variable End Of Life Decision (EOLD) was defined using an hierarchy that enabled the classification of each patient into one of five mutually exclusive categories: Cardiopulmonary resuscitation (CPR), brain death (BD), withholding (WH), withdrawing (WD) and shortening of the dying process (SDP). Basic descriptive statistics are presented as mean ± standard deviation for numeric variables, while for categorical and discrete variables the entire distribution is tabulated. When appropriate scarce cells were combined or deleted. The associations of EOLD with the categorical variables region and physician's religion were tested by means of the Chi-square test. When any cell had an expected frequency of less than 5 an exact p-value substituted the routinely calculated asymptotic one. The choice of appropriate statistical tests for the numerical variables followed a thorough examination of the underlying distribution. Time lapse between two events (e.g. ICU admission and death) proved to be in all cases very skewed and significantly deviated from Normality by Kolmogorov-Smirnov test applied with Lilliefors significance correction. As a result those variables were tested for differences among groups determined by the region or the physician's religion usin the non-parametric Kruskal-Wallis Rank test. Statistical anlyses were performed using SPSS V10 and StatXact V4. A test was considered significant if $p < 0.05$.

Ethical aspects:

This was an observational study only. No interventions or treatments were administered to patients. Because of patient confidentiality and potential legal problems, countries and centres were given anonymous codes. Study patients were given consecutive numbers. As some countries had few or only one centre, consensus was obtained that all countries would be coded rather than have the country name identified. Helsinki/Ethics Committee approval with a waiver of informed consent was obtained from each institution. Several centres did not participate in the study because of difficulties in obtaining Helsinki Committee approval and only those centres with Helsinki approvals could be included.

The fact that some centres and indeed some countries could not take part suggests that the whole subject of the project has many ethical problems. In the original project, programme PC 963733 we aimed to define the ethical problems involved in this area. The concepts of beneficence and non-maleficence are illustrated by relative rates of withdrawal on the one hand and CPR on the other between countries and regions.

The study illuminated a number of ethical problems – there was an impression that the question of justice may have had some relationship to patient or family presence and or to input in decisions.

The principle of autonomy is difficult to apply satisfactorily in this area. – the study shows that in most cases patients wishes were not known and could not be elicited because of the severity of illness.

Similarly, the question of consent to life and death decisions is rather vague. In many of the countries studied only the patient themselves can give consent and there is no hierarchy of surrogates. In these circumstances, doctors are deemed to act in the patients best interest as shown by the views of doctors in the study in relation to treatment withdrawal. The study also examined how many doctors make their decision as part of good medical practice at least in their opinion.

The data presents the number of patients who have decision making capacity, how many patients or surrogates are involved in discussions and / or give consent for forgoing life sustaining treatment, whether autonomous or paternalistic decisions made and why decisions are reached, communication between caring staff is elucidated.

The mechanism of withholding and withdrawing treatment has been studied. The thorny questions of treatment withdrawal and the interface between the withdrawal and shortening the dying process are examined.

Meetings:

In addition to the plenary sessions noted above, there were also meetings of the European Society of Intensive Care Medicine Ethics Section attended by ETHICUS participants. Minutes of all those meetings are attached as appendices 1-9.

10. Study results, discussion and conclusions:

A. Study results

Between January 1, 1999 and June 30, 2001, there were 31,417 patients admitted to ICUs in 37 European centers in 17 countries. Patients were followed for two months from the decision to limit care or until death. Patients were excluded from the study if they were discharged alive from the ICU with no limitations or if there were limitations only after discharge from the ICU. During the study, 4280 patients died or had some limitation of life-sustaining treatments (withholding, withdrawing or shortening of the dying process). Of these 4280 patients, 32 were excluded from the study – 27 were less than 13 year old or their age was not known. Another five were excluded due to lack of end of life information. Thus, 4248 patients, or 13.5% of all patients admitted to the ICU were enrolled in the study.

Study patients ranged in age from 13-98. The mean age of the patients was 63 ± 17 (mean $\pm$ SD) years and 61% were male. The patient distribution by European regions is shown in Table 1. Approximately one third of patients were recruited from each region, with the middle region being slightly lower. Admitting diagnoses are shown in Table 2. Respiratory, cardiovascular and neurologic disorders accounted for more than 50% of the admissions.

The religious backgrounds of all patients and doctors are shown in Table 3. The majority of patients identified themselves as Catholic (32%) and Protestant (20%) Religious background was not known in 27% of patients. The religious background of the physicians was similar to that of patients, with 37% of physicians identifying themselves as Catholic and 21% identifying themselves as Protestant. Physicians reported no religion or “none” 22% of the time.

The mortality of the study group was 96%. The median ICU length of stay for all patients was four days. The median ICU length of stay until the first decision for limitation of therapy was 2.8 days. The median time from the decision to limit care until death was 14.8 hours.

The frequency, range and mortality of the different end of life categories are shown in Table 4. There was variability in the limitations or manner patients died, CPR (5-48%), withholding (16-70%), withdrawing (5-69%) and shortening of the dying process (0-19%). Withholding preceded or accompanied withdrawing therapy in 1335 (95%) of patients undergoing withdrawing. All patients with CPR, brain death and shortening of the dying process died whereas 89% with withholding and 99% with withdrawing died. All patients who underwent shortening of the dying process had previous withholding or withdrawing. Shortening of the dying process occurred in seven countries. Treatments for 94 patients with shortening of the dying process included opiates and benzodiazepines (57), opiates (27), opiates, benzodiazepines and barbiturates (6), benzodiazepines (3) and barbiturates (1). There is also variation in the end of life categories by country (Figure 1) and by region (Table 5, Figure 2) ($p<0.01$). Table 5 and Figure 2 show each of the end of life categories by region. There was more CPR (30%) and less withdrawing (18%) and shortening of the dying process (0%) in the Southern countries than Central (18%, 34%, 6%) or Northern European countries (10%, 48%, 1%) respectively, $p<0.01$.

Variability in end-of-life decision-making was correlated with physician religion, as shown in Table 6. Physicians withdrew therapy significantly more often if they were Protestant, Catholic or had no religious affiliation than if they were Moslem, Jewish or Greek Orthodox ($p<0.01$). Withholding therapy occurred more commonly if physicians were Jewish, Greek Orthodox or Moslem than if they had no religious affiliation, were Protestant or Catholic ($p<0.01$). CPR was administered more often if physicians were Moslem or Greek Orthodox.

Of the 3086 patients who had limitations of therapy, 2734 (89%) were mechanically ventilated and 2324 (75%) were receiving vasopressor agents. The first treatment limitation included withholding CPR in 89% of patients, withholding or withdrawing vasopressors in 19% and 16% of patients respectively and withholding or withdrawing mechanical ventilation in 10% and 4% respectively. Table 7 demonstrates variations in end-of-life treatments based on region. Vasopressors were more often withheld in Southern than in Northern or Middle regions, but withdrawing of vasopressors was slightly more common in Middle than in Southern or Northern regions. Mechanical ventilation was withheld more frequently in Northern than in Middle or Southern regions. Withdrawal of mechanical ventilation occurred with equal frequency in all regions.

The primary reason for withholding, withdrawing or shortening the dying process is shown in Table 8. Patients with brain death and CPR were excluded. The most common reason cited by physicians for limiting care was that the patient had not responded to maximal therapy. This occurred in 46% of the patients. Other reasons frequently cited were neurologic problems, underlying chronic disease and failure of multiple organs (MSOF).

The primary considerations for end of life decision-making are shown in Table 9. Good medical practice was, by far, the major consideration for these decisions and occurred in 66% of patients. The next, but far less common consideration, was that the decision was in the best interest of the patient (28%).

When physicians were asked if they had major difficulties in withholding, withdrawing or shortening the dying process, 89% stated they had no difficulty, 5% medical difficulties, 3% ethical difficulties and 2% legal difficulties.

When the end-of-life decision was made, only 195 patients (5%) were deemed mentally competent. The vast majority of patients, 4053 (95%), were deemed medically incompetent to make these end-of-life decisions. Despite the fact that 195 patients were considered competent, end-of-life decisions were discussed with only 96 (49%) of them. For the majority of patients [2990 (97%)], no end-of-life discussions occurred. The reasons that there were no end-of life discussions with the patient were that the patient was unconscious in 2824 (92%) of patients, the patient would not understand in 98 (3%), and other reasons in 164 (5%).

By contrast, end-of life discussions took place with 2107 (68%) family members. Discussions involve the 3086 patients who had withholding, withdrawing or shortening of the dying process. Patient wishes regarding care at the end of life were not known for 2702 (64%) patients. This information was available for only 850 patients (20%). In 694 patients, this information was considered "not applicable". This may be related to the fact that this included patients undergoing CPR or having brain death. Information about patient wishes were noted more commonly in Northern and Central countries Only 28 patients (1%) had living wills. As shown in Table 10, most often the family was told of the decision by the physician, rather than asked about the decision. The totals in the table are greater than 2107 because some families were asked and told. Discussions with families occurred more commonly in Northern and Central countries. Discussions regarding these end-of-life issues did not take place in 32% families. Reasons that such discussions did not occur with family members are shown in Table 11. The most common reason cited by physicians was that the patient was unresponsive to maximal therapy. Somewhat difficult to understand and requiring further studies is that 241 times the reason given was that the family "won't understand."

Primary care physicians were involved in these end-of-life discussions for 1897 (62%) patients. There was no interaction with the primary care provider in 38% of instances. End-of-life decisions were discussed with consulting physicians for 1212 (39%) patients, but not for 61% of patients. Discussions with other physicians in the intensive care unit occurred for 2833 (92%) patients but not for 8%. Most of the time, there was agreement between ICU physicians and other physicians regarding end-of-life decisions. There was physician agreement for 2205 (72%) patients, disagreement for 64 (2%) patients and a "not applicable" response for 813 (26%) patients.

For the majority of patients [2412 (78%)], end-of-life decisions were discussed with nurses. However for 22% of patients, end-of life decisions were not discussed with nurses. Reasons that these discussions did not occur are not immediately apparent and require further study. For the majority of patients [2550 (83%)], there was agreement in the end-of-life decisions between physicians and nurses. For 20 (1%) patients, there was disagreement. For 512 (16%) patients, the response to the question was "not applicable". It is not immediately obvious why such a large number of responses were in this latter category.

There was agreement between staff and patients for end-of life decisions only 116 (4%) times. In 21 (1%) instances, there was disagreement for these end-of-life decisions between staff and patients. For the vast majority of patients [2945 (95%)], this issue was "not applicable". This undoubtedly was due to the fact that a majority of patients were deemed medically incompetent and/or were unconscious at the time these end-of-life decisions were made.

There was agreement for end-of-life decisions between the staff and family members for 2035 (66%) patients. Disagreement occurred 45 (1%) times. In 1002 (33%) instances, this question was considered “not applicable”. Certainly the unavailability of family members accounted for some of the “not applicable” responses. It may also be related to the fact that many patients were unresponsive to medical therapy or physicians believed families would not understand. However, reasons for this response need further investigation.

The person initiating discussion of these end-of life issues is shown in Table 12. As expected, the ICU physician initiated these discussions for the majority of patients (79%). The patient rarely initiated these discussions (1%), as most were not competent or unconscious.

Limitation of treatments was documented in the medical record for 2134 (69%) patients, was absent for 905 (30%) patients and was considered “not applicable” or “other” for 47 (1%) patients. Documentation was less common in Southern countries (31%) than Central (72%) or Northern countries (87%). Written orders for DNR or no CPR were present in 1991 (65%) charts, absent in 1034 (34%) charts and considered “not applicable” or “other” for 61 (2%) patients. Written orders were less common in Southern countries (19%) than Central (17%) or Northern countries (87%). Thus, documentation of limitations in the medical record and a written order for DNR were found in only approximately two-thirds of patients.

B. Discussion

The present study demonstrates that end of life decisions are common in European ICUs. Life support was limited in 73% of patients and CPR was performed in only 20%. The most frequent limitation was withholding followed by withdrawing life-sustaining treatments. Although rare, the present study documents active euthanasia in several European countries. Previous studies noted greater withdrawing than withholding of therapies. The present study showed a greater frequency of withholding than withdrawing treatment. This may be related to differences between Europe and the United States or the fact that the present study investigated many more patients in many different countries.

There was great variability in the limitations and manner patients died between countries. This may relate to several factors. First, the religions and cultures of the European countries vary and significant differences in decisions were noted based on the religion and regions. Second, physician values and practices may differ in different countries. This study demonstrated diverse regional practices in withholding and withdrawing mechanical ventilation and vasopressors. In addition, extreme variations were noted for both aggressive and non-aggressive decisions. CPR rates of 48% and withdrawing of 5% may indicate excessive treatment whereas CPR rates of 5% and withdrawing of 69% may signify inadequate aggressive care. Finally, the variability may be related to changes in end of life practices but occurring at different rates and degrees in different countries.

The present study documents that there is little autonomy in end-of-life decision making in ICUs. Patients were unconscious and/or lacked decision making capacity. Even in those patients who were competent, discussions occurred in only half. In the majority of patients, their previous wishes were unknown by their families or presumed

surrogate decision makers. Living wills were rare. When families participated in discussions, they were often told what would be done rather than asked what the patient would prefer. It may be that discussions did not occur because of beneficence or non-maleficence. As patients were unresponsive to maximal therapy, it would not be helpful to ask what a patient would want as nothing more could be done. This would certainly not explain why discussions did not occur at all in approximately one quarter of families because they would not understand. It is also unclear why, if patient representatives are required to consent for various medical interventions for incompetent patients, they are not required to consent to end-of-life decisions.

It appears doctors still have a paternalistic attitude regarding end-of-life decisions. Discussions at times did not include patients or families and often, did not even include other physicians or nurses. Rarely was a reason for limiting therapy a patient or family request. In fact, the primary consideration for decisions was usually a professional one, good medical practice, rather than beneficence, the best interest of the patient or an autonomous decision. This may be because decisions were made very late and the patient could not survive when unresponsive to maximal therapies. One wonders whether some of these decisions should have been made earlier. Perhaps more patient or family input would have led to more autonomous and earlier decisions.

There are limitations to the present study. The patients studied may not be representative of what actually occurs in European countries. There were one to four centers in each country whose actions may differ from the many other ICUs in the same country. In addition, participants were interested in ethical issues and their actions may not reflect those of other doctors. Under-reporting of practices for fear of legal ramifications can not be excluded. The findings of the present study, however, do reflect what physicians from different countries state they do and anonymity probably led to accurate reporting.

Policies and guidelines related to end of life decisions have been promulgated in North America but not for Europe. Only with knowledge of actual physician behavior such as observed in the present study can appropriate policies be implemented. Although there are differences in end of life decisions in European ICUs and more information is needed to ascertain what European patients and families desire at the end of life based on their specific religion and culture, a common foundation of principles and practices exists to enable the development of such guidelines and policies.

C. Conclusions

a. End-of-life decisions are common. The most frequent causes of death are withholding and withdrawing life-sustaining treatments. Withholding usually accompanies withdrawing. CPR and brain death are less frequent. Shortening of the dying process is rare, but occurs.

There is great variability in the way patients die between countries. This is reflected by a combination of factors, including the religion, culture and professional codes.

b. The majority of patients are not mentally competent and unconscious at the time of end-of life decision-making. Patient wishes concerning end-of-life decisions usually are not known at the time these decisions are made. Living wills are rare. Discussions about end-of-life decisions occur with families, but not always. Available information commonly comes from

families. These discussions rarely occur with patients because patients are usually unconscious at the time these decisions are made.

c. Physicians don't discuss end-of life decisions with families because patients are unresponsive to maximal therapy, because physicians think that the family won't understand or because the family is not available.

d. The ICU physician usually initiates the end-of-life decision. Physicians discuss their end-of-life decisions more often with other ICU physicians than with primary doctors. Doctors also discuss end-of-life decisions with nurses but perhaps not as much as they should.

Doctors and nurses usually agree about end-of-life decisions. Medical staff and families also usually agree about these end-of-life decisions.

e. Documentation of limitations of life-sustaining therapies in the medical record and written orders for DNR occur, but not always.

f. There is regional variability in discussions and documentation of end-of-life decisions.

11. Future Research needs:

This study has raised several issues that should be addressed in future studies:

a. Determine how patient preferences regarding end-of-life care can be made earlier than in the ICU.
b. Develop mechanisms for increasing patient autonomy.
c. Evaluate mechanisms to determine how patient preferences can be made earlier than in the ICU.
d. Determine what treatments and care patients and families want at the end of life (different countries and cultures may have different desires).
e. Determine if patients and families want to be involved in end-of-life decisions and how much information they desire (different countries and cultures may have different desires).
f. Determine if doctors and nurses would want the same care for themselves as they provide to patients.
g. Determine why doctors are reluctant to discuss end-of-life issues with patients and families.
h. Determine why doctors don't discuss end-of-life issues more with nurses and other colleagues
i. Determine why doctors don't write orders or document end-of-life decisions
j. Determine if there is a need for patient advocates in ICUs or hospitals. These advocates could serve as intermediaries between medical (physician/nursing) staff, patients and families.
k. Determine why doctors' primary consideration for end-of-life decisions is good medical practice and not patient best interest.
l. Determine why most doctors have no medical, ethical or legal difficulty in end-of-life decisions.
m. Determine why doctors believe families won't understand.
n. Determine why so many families are unavailable.
o. Determine how to identify patients who will become unresponsive to maximal therapy earlier.

p. Determine how to utilize ICUs more efficiently for patients that doctors are certain will die.
q. Determine why some doctors perform CPR so frequently.

Based on this study, the following recommendations are made:

a. Make further research into ethical end-of-life issues an EU priority.
b. Determine the causes for end-of-life variability between countries.
c. Educate the public and health care professionals regarding advanced directives and health care proxies.
d. Educate doctors to communicate more effectively with patients and families.
e. Educate doctors to emphasise autonomy and beneficence more than paternalism and professionalism.
f. Educate doctors that withholding and/or withdrawing life-sustaining therapy are acceptable.
g. Educate doctors on the importance of writing orders and documenting end-of-life decisions.

12. Project related publications:

The results of this study were presented at the ESICM in Geneva in September 2001 and are currently being prepared for publication.

13. Deliverables

Prior to enrollment, there was consensus on the following definitions. The following definitions were used for end-of-life decision making in this project.

Withholding (WH) treatment - a decision was made not to start or increase a life-saving intervention. This includes any patient who did not have CPR (WH CPR or DNR) and/or a decision was made not to start vasopressor agents if the patient goes into shock or not increase the dose of vasopressors if the patient was already receiving the vasopressor.

Withdrawing (WD) treatment - a decision was made to actively stop a life-sustaining intervention presently being given. This includes the discontinuation of mechanical ventilation, vasopressor therapy, oxygen supplementation *or any treatment or procedure while it is being infused or performed. If one discontinues an intermitted treatment or procedure which is not at that time being infused or performed (antibiotic, dialysis), but is considered presently being given (because of a previous order for example) this will be WD*. Weaning therapies for clinical and physiological reasons are not considered withdrawing.

Active *shortening of the dying process* (*SDP)* - a circumstance in which someone performs an act with the specific intent of *shortening the dying process*. Excluded are acts of withholding or withdrawing life-sustaining treatments. Examples include an intentional overdose of narcotics, *anesthetics* or potassium chloride.

Cardiopulmonary Resuscitation (CPR) - *ventilation and cardiac massage*

Brain Death - *documented cessation of cerebral function*. This includes irreversible cessation of all functions of the entire brain, including the *brain stem.*

14. Acknowledgements:

The coordinators and investigators acknowledge the tireless efforts of Mrs. Barbara Piperno, study administrator, and Ms. Julie Benbenishty, coordinating nurse, to assure the quality and smooth running of this project.

TABLE 1

DISTRIBUTION OF PATIENTS BY EUROPEAN REGIONS

REGION	**COUNTRY**	**NUMBER OF PATIENTS**
NORTHERN	DENMARK	
	NETHERLANDS	
	FINLAND	
	IRELAND	
	SWEDEN	
	UNITED KINGDOM	
	TOTAL	**1505**
CENTRAL	AUSTRIA	
	BELGIUM	
	CZECHIA	
	SWITZERLAND	
	GERMANY	
	TOTAL	**1209**
SOUTHERN	GREECE	
	ISRAEL	
	ITALY	
	PORTUGAL	
	SPAIN	
	TURKEY	
	TOTAL	**1534**
TOTAL		**4248**

TABLE 2

ICU ADMISSION DISORDERS

DISORDER	PATIENTS	PERCENT
RESPIRATORY	937	22
CARDIOVASCULAR	730	17
NEUROLOGIC	656	15
GASTROINTESTINAL	591	14
SURGERY	426	10
SEPSIS	403	9
TRAUMA	283	7
METABOLIC	117	3
HEMATOLOGIC	38	1
MOSF	28	1
OTHER	39	1
TOTAL	4248	100.0

MOSF – Multiple organ system failure

TABLE 3

PATIENT AND DOCTOR RELIGION

RELIGION	PATIENT		DOCTOR	
	NUMBER	PERCENT	NUMBER	PERCENT OF PATIENTS
CATHOLIC	1346	32	1554	37
PROTESTANT	861	20	883	21
GREEK ORTHODOX	334	8	330	8
JEWISH	243	6	393	9
MOSLEM	117	3	38	1
NONE	118	3	957	22
UNKNOWN	1159	27	67	1
OTHER	70	1	26	1
TOTAL	4248	100	4248	100

TABLE 4

NUMBER, PERCENT, RANGE AND MORTALITY

OF THE END OF LIFE CATEGORIES

	NUMBER (%)	RANGE (%)	MORTALITY (%)
CPR	832 (19.6)	5 – 48	100
BRAIN DEATH	330 (7.8)	0 – 15	100
WITHHOLD	1594 (37.5)	16 – 70	89
WITHDRAW	1398 (32.9)	5 – 69	99
SDP	94 (2.2)	0 – 19	100
TOTAL	4248 (100)	0 – 70	96

TABLE 5

END OF LIFE CATEGORIES AND PERCENTAGE (%) BY REGION

	CPR	BRAIN DEATH	WITHHOLD	WITHDRAW	SDP
NORTHERN	154 (10)	48 (3)	575 (38)	714 (47)	14 (1)
CENTRAL	217 (18)	92 (8)	412 (34)	409 (34)	79 (7)
SOUTHERN	461 (30)	190 (12)	607 (40)	275 (18)	1 (0)
TOTAL	832 (20)	330 (8)	1594 (38)	1398 (33)	94 (2)

TABLE 6

CPR, WITHHOLDING AND WITHDRAWING BASED ON DOCTOR'S RELIGION

RELIGION	CPR		WITHDRAWING		WITHHOLDING	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
CATHOLIC	317	22	648	46	450	32
PROTESTANT	84	10	390	46	380	44
GREEK ORTHODOX	109	39	37	13	131	47
JEWISH	60	16	58	16	251	68
MOSLEM	14	37	9	24	15	39
NONE	209	24	331	38	338	38
TOTAL	793	21	1473	38	1565	41

$P < 0.001$

TABLE 7

WITHHOLDING AND WITHDRAWING CPR, VASOPRESSORS AND MECHANICAL VENTILATION BASED ON REGION

	NORTHERN		MIDDLE		SOUTHERN		TOTAL LIMITATIONS	
	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT	NUMBER	PERCENT
CPR WITHHOLD	1171	90	824	92	765	90	2760	90
VASOPRESSORS WITHHOLD	223	17	139	16	238	28	600	20
VASOPRESSORS WITHDRAW	206	16	164	18	111	13	481	16
MECHANICAL VENTILATION WITHHOLD	194	15	56	6	57	7	307	10
MECHANICAL VENTILATION WITHDRAW	51	4	43	5	38	4	132	4
TOTAL PATIENTS	1304	100	891	100	867	100	3062	100

$P < 0.01$

TABLE 8

PRIMARY REASON FOR WITHHOLDING, WITHDRAWING AND SHORTENING THE DYING PROCESS

(%)	NUMBER	REASON
46	1425	Unresponsive to therapy
20	615	Neurologic
12	379	Chronic disease
10	295	MSOF
4	126	Poor quality of life
3	104	Patient/family request
2	65	Sepsis/shock
2	46	Age
1	31	Other
100	3086	TOTAL

TABLE 9

PRIMARY CONSIDERATION FOR END-OF-LIFE DECISION-MAKING

(%)	NUMBER	REASON
66	2025	Good medical practice
28	874	Best interest of patient
2	62	Autonomous decision
1	28	Cost effectiveness
1	28	Living will
1	17	Social/family pressures
1	32	Other considerations
100	3086	TOTAL

TABLE 10

HOW END-OF-LIFE DECISIONS WERE DISCUSSED WITH FAMILY MEMBERS

	TOLD FAMILY		ASKED FAMILY	
	NO	YES	NO	YES
WITHHOLDING	143	745	481	406
WITHDRAWING	101	1025	749	375
SHORTENING THE DYING PROCESS	9	74	68	16
TOTAL	253	1844	1298	797

TABLE 11

REASONS END-OF-LIFE DECISIONS WERE NOT DISCUSSED WITH FAMILY MEMBERS

REASON	NUMBER	%
PATIENT UNRESPONSIVE TO MAXIMAL THERAPY	385	39
FAMILY UNAVAILABLE	275	28
FAMILY WON'T UNDERSTAND	241	25
NOT APPLICABLE OR OTHER	78	8
TOTAL	979	100

TABLE 12

INITIATOR OF END-OF-LIFE DISCUSSIONS

INITIATOR	NUMBER	%
ICU PHYSICIAN	2438	79
PRIMARY CARE PHYSICIAN	328	11
FAMILY	119	4
CONSULTING PHYSICIAN	105	3
NURSE	66	2
PATIENT	19	1
MISSING	11	0
TOTAL	3075	100

FIGURE 1

CPR AND WITHHOLDING AND WITHDRAWING LIFE-SUSTAINING TREATMENTS BY COUNTRY

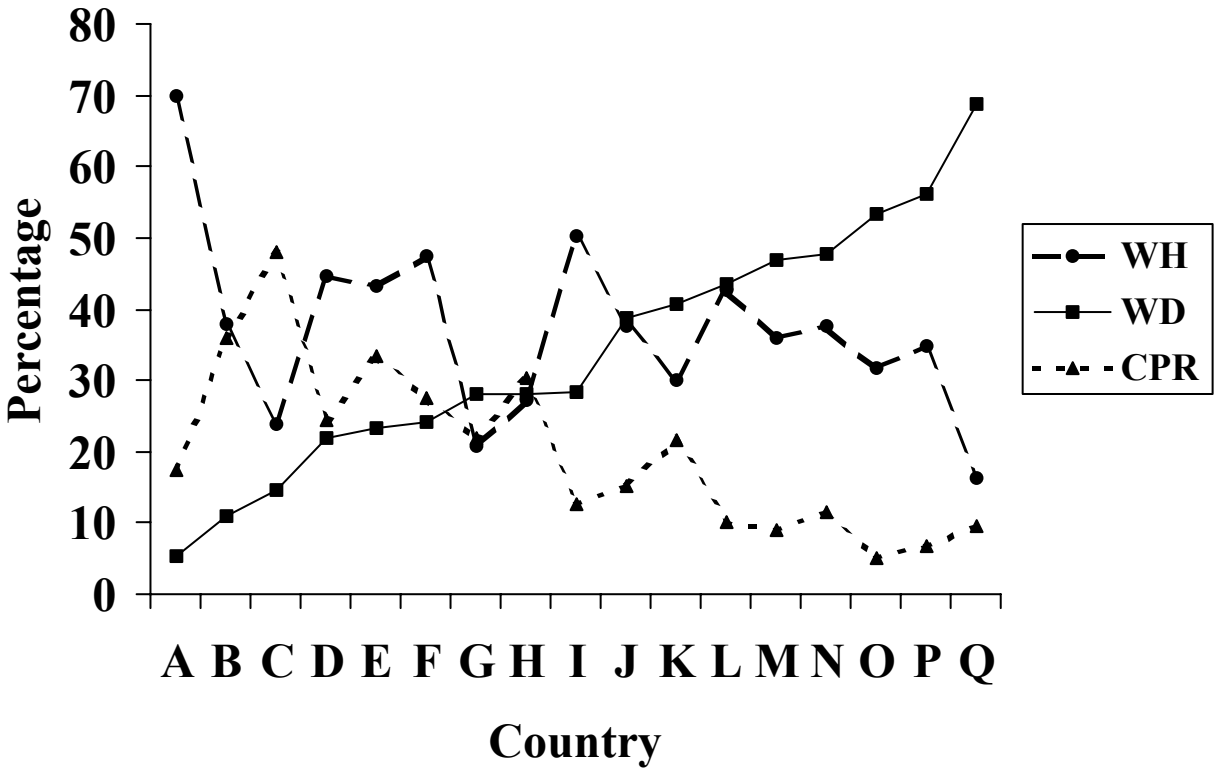

FIGURE 2

END OF LIFE CATEGORIES BY REGIONS