LIFE ON THE EDGE:
PRETERM BIRTHS AT THE LIMIT OF VIABILITY

COMMITTED TO THEIR SURVIVAL, ARE WE EQUALLY COMMITTED TO THEIR PREVENTION AND LONG-TERM CARE?

by Greg R. Alexander, MPH, ScD
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Between 1980 and 1997 the proportions of Low BirthWeight (LBW), Very Low BirthWeight (VLBW) and preterm infants in the United States (US) increased conspicuously. The LBW (<2500 grams) birthrate rose more than 10% over this period. The VLBW (<1500 grams) birthrate rose from 1.15% to 1.45%, an increase of more than 25%. The preterm (gestational age <37 weeks) birthrate followed closely behind the VLBW birthrate.[1.] The obvious and far-reaching implications of the problem at hand have finally demanded that the full attention of health professionals and policy-makers be focused on this steadily growing proportion and number of infants born too early or too small.

In stark contrast to the continual rise in the US premature birthrate, our infant mortality rate (number of infant deaths in the first year of life per 1000 live births) declined over 40% between 1980 and 1997[1.], a noteworthy achievement reflecting ongoing efforts to improve survival and bring our infant mortality rate down to those of other developed nations. Our current infant mortality rate nevertheless remains one of the highest among developed nations, exceeding those of Greece and some other nations which failed to make the Top Twenty List of Developed Nations With the Lowest Infant Death Rate.[1.]

Progress toward reducing the infant mortality rate continues yet we are unable to reduce preterm and VLBW birthrates or even check their rise. This is a serious problem. The majority of infant deaths and approximately three-fourths of neonatal deaths occur among preterm infants. High preterm birthrates continue to be a major contributor to our infant mortality rate.[1.-3.] Of even greater concern, surviving VLBW and preterm infants face significant morbidity risks with greater risk of cerebral palsy, mental retardation, sensory impairment, learning disabilities and school-related problems than mature births.[3.-10.] Preterm birth has been determined to be responsible for long-term neurological impairment in nearly half of children so effected.[3.]

Recognition of the problems associated with premature delivery plus the importance of addressing this public health and healthcare concern has taken several decades. In 1985 the Institute of Medicine (IOM) published its seminal study entitled Preventing Low Birth Weight.[11.] The report identified LBW as a "major determinant of infant mortality". In order to reduce the LBW birthrate in the US the authors recommended ensuring better access to prenatal care and improving the quality of existing prenatal care. Since

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Acknowledgment: This work was supported in part by DHHS, HRSA, and MCHB grants MCJ-9040 and MCJ-019355.

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THE PRESIDENTIAL BOX

by Paul Sinkhorn, President

Those who attended the 2000 ACM in San Francisco last May were treated to seminars on many controversial clinical topics as well as a millennial exhibition of new and exciting medical technology. The Society's get-together was highlighted by Jef Raynes' interactive presentation. He's a plaintiff's medmal attorney from the Los Angeles area and provided frank, valuable insight into the ethics, responsibilities, motivations and strategies of both defense and plaintiff lawyers plus practical advice on how to eat, drink, think, walk, talk and dress like a credible medical expert witness. I personally learned more about how to be an effective witness in one hour with Jeff than in all the comparable presentations I have previously attended.

I attended a postgraduate course on operative obstetrics and was heartened to hear our academic colleagues advocating continued use of obstetric forceps and vacuum extractors to expedite vaginal delivery. Arnold Relman delivered the keynote Cosgrove Lecture on Monday to open the week's activities and implored us to return to a more decentralized practice of medicine with small groups of local physicians contracting directly with area employers and consumers to provide medical care.

Of special interest was Tuesday afternoon's symposium on term fetal brain injury. Presenters agreed that only 10% of diagnosed cerebral palsy cases can be reasonably attributed to intrapartum events and many are idiopathic. There appears to be a significant subgroup that may be due to events occuring postnatally in the newborn nursery. Most intriguing is that which can occur antepartum *in utero*. These feti may actually have hemorrhagic CVAs of varying extent secondary to coagulation defects or experience CNS complications of undiagnosed maternal infections, recovering to the point of having normal EFM tracings in labor but exhibiting signs of brain injury in the newborn nursery.

One presenter demonstrated how crucial timely performance of serial neonatal CNS imaging studies is for correct diagnosis and obstetricians' risk management. A CT scan of the brain performed immediately after birth may show the same pathologic changes as one performed several days later, but if the first scan is not available the later one by itself will support the mistaken impression that an intrapartum brain injury occurred. Another presenter wished the latest knowledge on etiology of cerebral palsy an expedited appearance in the courtroom.

Much at the ACM seemed to revolve around diagnosis and prevention of preterm birth with all its consequences. In addition to the educational presentations on prematurity, several corporate exhibitors proffered their own solutions. The exhibit hall was crowded with multiple companies' 3D ultrasound machines showing cute little fetal faces. As this technology matures more accurate prediction of fetal weight should be possible and difficult decisions about preterm delivery a little easier.

Assay of fetal fibronectin as a predictor of preterm birth now appears to have reached the point of clinical utility. An easily obtained cervical swab is submitted with results from a reference lab within 24 hours, one hour if your hospital performs the assay. The negative predictive value (no risk of delivery within seven days) between 24 and 34 weeks gestation approaches 99%. Salivary estriol assay also seems to have reasonable predictive value for imminent onset of labor.

The FDA has finally approved continuous fetal oximetry technology. One product exhibited involved an $11,000.00 unit compatible via a patch cable with existing EFM monitors. A disposable, soft silicone rubber probe costing about $145.00 lies in direct contact with the fetal cheek. The monitor displays a digital readout in addition to printing a continuous linear recording of fetal oxygen saturation directly onto the standard EFM strip. You can observe changes in fetal oxygenation during and after a deceleration in real-time. I found myself wondering how many defendants in medmal cases alleging undiagnosed and untreated intrapartum hypoxic brain damage could be exonerated by such a system. I believe this can revolutionize litigation of all cerebral palsy suits, especially those in premature infants which seem to occur more frequently.

We live today in difficult medicolegal times. Answering one question only poses five more, yet I remain optimistic about the ingenuity of those dedicated to expanding our specialty's knowledge and improving our patient care. I applaud their efforts to apply scientific technology's advancements to medicine, not only because it makes my job as a clinically practicing obstetrician easier but also because it gives me more credible arguments to use in my job as a medical expert witness.

THE WITNESS BOX

by Doug Daniel, Editor

The issue of abortion is one of the most contentious and controversial in contemporary American society. It presents extraordinarily difficult questions that, as the Court recognizes, involve "virtually irreconcilable points of view".

Supreme Court of the United States Justice Sandra Day O'Connor

Opening statement of her opinion concurring with the five-to-four majority of Justices Breyer, Stevens, O'Connor, Souter and Ginsburg in *Stenberg, Attorney General of Nebraska, et al. v. Carhart,* affirming the Federal District Court and 8th Circuit US Court of Appeals decisions declaring unconstitutional Nebraska's statute prohibiting "partial birth abortion". Decided 28 JUNE 2000 with Justices Scalia, Kennedy, Thomas and Chief Justice Reinquist dissenting.

We gain three new members this month including two Honorary Members. Larry Kramer practices general obstetrics and gynecology in Glen Head, New York, graduated from New York Medical College and finished his residency at Brookdale Hospital in Brooklyn. He's interested in medmal issues and medical expert witness work. Maurice Druzin co-wrote "Was Cragin Right After All?" in the last *Newsletter* and his introduction is in it's "Witness Box". Tom Purdon is currently ACOG President Elect and will be inaugurated at the 2001 ACM in Chicago by Ben Harer. He interned at Wayne County General Hospital in Detroit and did his residency at the University of Iowa where he previously attended med school. Tom's special clinical interest is hysteroscopy. Welcome aboard!

Tom was among the attendees in San Francisco at our ACM clinical seminar on impaired physicians, making some pertinent observations and comments along with saying some nice things about the Society's Impaired Physicians Project. Later in the week I spent part of an afternoon talking to him about the Society in general, the Impaired Physicians Project in particular, and asking how the Society could take a larger part in College-sponsored education projects. He seemed genuinely interested and promised to help as much as he could, even suggesting some opportunities we had neglected to consider. Walking him back to his hotel as we chatted about other things, I got to thinking.

For several years Dan, myself and the rest of the Board have grappled with where to go and what to do with the Society. It continues to be a never-ending problem with no solution in sight. Every current and past member of the Society has been asked at least once, some more, what we could do to make the Society prosper. Membership growth has continued to be abysmal, recently not even maintaining dues income. Upon concerted search, no other sources of income have been found. Only through the continuing interest and help of the College have we been able to keep the Impaired Physicians Project barely afloat.

Today we count the President, President-Elect and Executive Vice President of the College among our members, all taking an active interest in the Society. Folks, if it don't happen over the next three years we might as well call in the dogs and pee on the fire 'cause it ain't never gonna happen. If you've talked to someone about joining the Society, call me and leave their name and address. I'll send them an information packet with a copy of the *Newsletter* plus an application for membership. Call the same number if you prefer they be personally contacted by phone. The phone here at ASFOG Central ain't exactly ringing off the hook with people begging to join.

I recently had the extreme pleasure of visiting some of our members while wending my way to San Francisco for the ACM. So Kenny, Dan and Rob, thanks for your time, hospitality and conversation. You gave me lots to think about as to what the Society is going to do over the next few years. To those I missed, see you next time. I plan on doing the same thing on my way to Chicago's ACM next year.

We had five members and four guests at our membership meeting Sunday evening of the ACM. Ben Harer and his lovely wife showed up plus Paul Sinkhorn, Rob Olson, Ray Cestero and myself. Ray arranged the program presented by Jef Raines and it was outstanding by all reports with the only downside being too few people heard it.

The Clinical Seminar on impaired physicians Dan Avery and I put on sold over half its 60 seats but was attended by only 25-30 people. The good news is that five of them were officers or senior administrative staff of the College. If their comments were heartfelt, and I believe they were, the Society's Impaired Physicians Project should really take-off over the next year or two. The presentation was audiotaped with excellent technical results and is ideal for medical staff or medical society programs on physician impairment. It runs about 90 minutes and if you want information on how to obtain a copy, call me. In the alternative, Dan and I are available to bring it up close and personal to a venue near you as Dr. Bob's Impaired Physicians Traveling Road Show Extravaganza featuring Bill W's Tap-Dancing Performing Trained Bears with Special Guest Appearances by Various Impaired Colleagues Widely Known to One and All. After the Seminar Dan and I decided the audience's overwhelmingly positive response justified making it more widely available, so if you know anyone who might be interested be sure to give me a call.

Michele Curtis' Luncheon Conference on gender discrimination sold out, Dan's on physician drug testing had five unsold seats and mine on dealing with impaired colleagues had four. All in all a pretty good turn-out and much better than last year. The Caduceus meeting on Sunday evening was again a disappointment with only one physician in recovery showing up, but we had a great time anyway.

This issue of the *Newsletter* is our annual dedicated issue, asking the hard questions about current and future management of preemies and ultrapreemies. The lead article is by co-authors Greg Alexander, Donna Petersen and Marilee Allen, a take-no-prisoners piece which cuts right to the heart of the matter and sets the stage for the following debates on what to do with preemies, especially Extremely Low BirthWeight (ELBW) infants. Like the poor, the problem has been with us always while the definition of potentially salvageable in weeks gestation or estimated fetal weight falls progressively lower and lower, seemingly free of financial constraints and limited only by the ever-expanding boundaries of our medical knowledge and technology. Soon to be encountered are the rock-solid realities of prioritizing available healthcare financial resources, applying cost-effective accounting principles to clinical decisions and the inevitable rationing of mismanaged healthcare. These will impose a heretofore unknown limit on our ability to gamble huge sums of money on the survival and quality of life of ELBW, VLBW and premature infants. We will no longer be able to afford our previously admirable altruistic philosophy of exercising every possible known alternative for as long as it takes to "save" these patients, or at the end of a very long and difficult journey finally letting them die.

Greg is Professor and Chair of Maternal and Child Health at the School of Public Health, UAB-Birmingham and holds a BS from the College of Charleston, MPH from the University of South Carolina and a doctorate in maternal and child health from The Johns Hopkins University School of Hygiene and Public Health in Baltimore. He has previously served on the faculties of the University of Hawaii, The Johns Hopkins University and the University of Minnesota in Minneapolis where he was also Chair of Maternal and Child Health. He has authored or co-authored over 100 (now over 101) peer-reviewed articles plus many textbook chapters while serving on the editorial boards of four professional journals, one also as Associate Editor. Greg somehow still finds time to be a reviewer for 20 other major professional journals plus actively continuing his research in prenatal and maternal/child health epidemiology, recently developing and directing an international conference on the prevention of preterm birth. He has served as a consultant/visiting professor to the National Institutes of Health and multiple universities in the US and Europe.

Donna is currently Associate Dean for Academic Affairs and Associate Professor of Maternal and Child Health at the UAB-Birmingham School of Public Health. She holds a BA from Drew University in behavioral science plus masters and doctorate degrees in maternal and child health from The Johns Hopkins University School of Hygiene and Public Health. Prior to her move to Birmingham she was Director of the Division of Family Health , Minnesota Department of Health and Assistant Professor of Maternal and Child Health at the University of Minnesota School of Public Health.

Marilee a practicing neonatologist and neurodevelopmental pediatrician currently Associate Director of Neonatology and Assistant Professor of Pediatrics at The John plus Co-Director of the Kennedy Krieger Institute's (KKI) NICU Developmental Clinic there. She holds a BS with honors from Cornell University in Ithaca, New York, and an MD from The Johns Hopkins University School of Medicine where she completed her pediatrics internship and residency plus a neonatology fellowship followed by a neurodevelopmental disabilities fellowship at KKI. Her clinical research has focused on the survival, development and long-term outcome of NICU newborns as well as early diagnosis and treatment of their neurodevelopmental disabilities.

Her 23 page CV reminds me of the magician's trick in which a seemingly never-ending stream of multicolored silk scarves keeps pouring out of his tuxedo jacket sleeve or pocket. In addition to the usual, Marilee has wrote or co-wrote tons of peer-reviewed articles, editorials, and textbook chapters. She's been interviewed by *Ladies Home Journal* and the newshounds from NBC and ABC on their nightly news programs plus multiple radio interviews including one of my favorite programs, NPR's "All Things Considered". There have been a series of prestigious awards both national and international and she reviews articles for *Acta Paediatrica*, *Archives of Pediatrics and Adolescent Medicine*, *Journal of Intensive Care Medicine*, *Journal of Pediatrics*, *New England Journal of Medicine*, and *Pediatrics* plus several others I've never heard of. She's even lectured at my dear old alma mater, Naval Hospital Bethesda. For the past couple of weeks I've been having nightmares of these three musketeer-like colleagues hanging together back in '70s wearing bellbottoms and tie-dyes with straight hair down to God-knows-where singing "Give Peace A Chance". At least they seem to have turned out O.K..

Remember Jack Webb's classic introduction to the original *Dragnet* series on 1950s television? "These stories are true. Only the names have been changed to protect the innocent." Premature infant mortality has always been one of life's truths. The dilemma posed by babies born too soon and too small hasn't changed much since Eve bore Cain. About the only things which have changed are the effectiveness of available medical treatments, their costs, and the not infrequently broken records for youngest gestational age and lowest birthweight to survive. And there's no more innocent victim than a fragile newborn struggling to continue a life which hangs by a very thin thread at the unstable edge of an abyss.

Twenty-three years ago in October of 1977 Joseph Butterfield, MD, wrote a brief op-ed piece for the then relatively young *Contemporary Ob-Gyn* entitled "Can society afford to save these babies?"(Contemporary Ob-Gyn 10:110, 1977). Butterfield was at the time Chairman of the Department of Perinatology at Children's Hospital in Denver and Professor of Pediatrics at the University of Colorado there. He raised essentially the same questions we ask today. Unlike us, he thought he had the answers in improving management of labor, liberalizing use of Caesarean section and improving NICU management. With the aid of retrospectroscopic vision we now know he didn't because essentially all three have been accomplished but to little avail except in 2000 we get 1977 results at about 500 gm lower birthweights. In all fairness to Dr. Butterworth though, there have been some surprises along the way.

There are untold numbers of people who owe their lives to Denver's remarkable perinatal medevac system which still serves most of the Rocky Mountain states clear to the Canadian border. The system provides rapid ground and air transportation with intensive in-route perinatal care delivered by a widely-diversified cadre of highly-trained medical, nursing and paramedical personnel who ride in a squadron of ambulance vans and various aircraft including helicopters plus fixed-wing jets and turboprops. The only differences over the years have been persistent increases in costs and potential salvageablility of infants at age-specific gestations and weights. Butterfield's article is reprinted immediately after Greg & Company's.

On a grimmer note, experts in the field are very concerned that in spite of huge medical expenditures, advanced technology and expanded knowledge many babies born at the edge who used to die relatively quickly are today being counted among the rescued. The reality is that we can keep them alive beyond a static, statistically defined mortality rate endpoint but many still die in the NICU, just a little later.

This month Paul Sinkhorn recaps the San Francisco ACM in his President's Box and I alert our readers to a recent significant change in College policy on prenatal and preconceptional HIV screening in this month's "Hot Box". Previously the recommendation had been to evaluate each patient's risk factors individually and push testing only for those determined to be at increased risk. Over the past several years it has become evident that maternal treatment during pregnancy and labor with antiretrovirals such as Acyclovir® markedly decreases the risk of vertical transmission of HIV virus and subsequent clinical AIDS to newborns by decreasing maternal viral loads, even in the absence of maternal evidence of clinical AIDS. Therefore the Feds and now the College say everyone regardless of risk should be screened either before planned conception or as soon as possible after, then treated prophylacticly if HIV positive. These policies also reverse previous unprecedentedly strong emphases on confidentially and informed consent counseling before and after testing, now putting HIV screening on a par with syphilis screening in spite of being in violation of some states' statutory requirements for testing. The bottom line is stay within your state's legal requirements but expect the Fed's policy to be quickly adopted by all states in spite of some flak from AIDS patient rights groups and the ACLU bunch.

Ben Harer grippingly fills this month's "Book Box" with a review of Angus McLaren's excellent though somewhat gruesome biography of Dr. Thomas Neill Cream, Scottish/Canadian/American/British physician and serial killer. While Cream's crimes were committed during the Victorian era, today's news is no better. Your pilot has illuminated the "Fasten Seat Belts" sign; this ride gets pretty bumpy.

This month's "Suggestion Box" is essentially my rant on our abandoning teaching our residents time-proven obstetric techniques for the idea *de jure*, specifically focusing on anesthesia for newborn circumcision, Caesarean section on demand and routine episiotomy. Like Dennis Miller says each week on his HBO show, "I could be wrong."

There's also the annual "Ballot Box" with the *Newsletter's* endorsements of candidates for College office. The bottom line is we all should be actively involved with the selection and election of our College officers while relying upon the judgment of our Committee on Nominations, but if you want to be listened to you've got to first make some noise. Power To The People!

In this month's "Litter Box" I try to give some perspective to Ben Harer's advocacy of unrestricted patient autonomy in electively choosing her preferred route of delivery, albeit with tongue gently but firmly thrust into my cheek. Hey, it's only one guy's opinion. Perhaps those disagreeing will see fit to respond in writing.

Getting back to the dedicated issue's theme articles, Martha Mullett provides a look at advances in survival and quality of life for ELBW preemies. When I was a resident viability was considered 28 weeks, now it's almost down to 24 and sure to drop even lower. When it gets to 24 or less, Justice O'Connor is really going to earn her salary. Martha tells us how this happened and provides useful advice on improving the care of our patients threatening to deliver these ultra premies.

Martha is Professor of Pediatrics at West Virginia University's Ruby Memorial Hospital. She earned her AB and MD degrees at WVU in addition to completing her pediatrics residency and neonatology fellowship there. There's also an MPH in public health from Harvard hanging on her wall. She's been director or Ruby's NICU, a member of WVU's Medical Corporation Board of Directors, University Senate, Chair of the School of Medicine's Committee on Women's issues and President of the West Virginia Perinatal Association. She's also acted as a civilian consultant to the Department of Defense and United States Army.

Next Nancy Chescheir steps up to the lectern to give us both the good news and the bad news about tocolytics. Contrary to initial expectations about thirty years ago and whiz-bang pharmaceutical marketing, they now seem to be a mixed bag for both mothers and babies. Any proven benefit of long-term therapy seems to be limited to a relatively small number of very premature gestations. Even then there is considerable danger involved in their use and both patients must be closely followed for adverse side-effects or deteriorating clinical condition, either of which can contraindicate continued prolongation of the pregnancy. Don't forget there's always Martha's option of maternal-fetal transfer to a Level III perinatal center where delivery at 28 weeks with good odds of survival and few if any complications is the norm. If any of you in smaller hospitals are still starting and maintaining folks on weeks of oral terbutaline while waiting for fetal lung maturity, maybe it's time to reconsider.

Nancy is a maternal-fetal medicine type working for Bob Cefalo in Chapel Hill, North Carolina, at the University of North Carolina School of Medicine. She holds both BS and MD degrees from UNC plus doing her residency and fellowship there, like Martha

pretty much homegrown. Currently Nancy is an Associate Professor at the medical school and in the past has served as Associate Dean plus Interim Chair of the Department of Obstetrics and Gynecology in addition to being an Editorial Consultant to *Obstetrics and Gynecology*, *The American Journal of Obstetrics and Gynecology*, *The Journal of Maternal-Fetal Medicine*, *The Journal of Pediatrics* and *Teratology* plus authoring or co-authoring an untold number of articles in our peer-reviewed literature. She's presented at several ACOG postgraduate courses and served on multiple College committees including the Committee on Scientific Program, is an ABOG examiner, member of AOA, and not surprisingly has twice won medical student teaching awards. Other professional and personal interests include membership on the North Carolina Medical Society's Domestic Violence Committee. Pretty impressive!

Mike Gardner's contribution sheds some light on the recurring dilemma of what to do with preemie twins, trips, etc. when faced with threatened or true premature labor. The bottom line again is quite simple. Unless you're in a Level III perinatal center you're best advised to quickly "mag 'um, meth 'um and move 'um". Seems almost too easy but it works.

Mike is Director of Obstetrics at Ben Taub General Hospital and an Assistant Professor at Baylor College of Medicine, both in Houston, Texas. He earned his undergraduate degree at Baylor University in Waco and New Mexico State University in Las Cruces, his MD at Texas Tech School of Medicine in Lubbock, and his MPH at University of Alabama-Birmingham. He completed his residency at Texas Tech Regional Academic Health Center and a fellowship in maternal-fetal medicine at UAB-Birmingham. Between residency and fellowship he served with the United States Air Force Medical Corps at Sheppard AFB, Texas, Andrews AFB, Maryland (Home of Air Force One and other VIPs), and for two years was Chief of Obstetrics and Gynecology at Lajes Hospital, Azores, Portugal. Mike reviews submitted articles for *Obstetrics and Gynecology*, *American Journal of Obstetrics and Gynecology*, *American Journal of Medicine*, *Medscape's Women's Health*, *American Journal of Managed Care* and *Journal of Maternal-Fetal Medicine* in addition to having authored and co-authored more articles in the peer-reviewed medical literature and textbook chapters than you can count. He has also been active in Russian and Indonesian international medical projects, is a published poet and speaks fluent Spanish. I on the other hand can't even simultaneously chew gum and walk without either biting my tongue or falling down.

There's also an eclectic sampling of reprints from other publications. Two articles from the North Carolina Medical Board's *Forum* address patient-physician communications and licensure concerns from the state board perspective. An editorial from a recent *Kentucky Board of Medical Licensure Newsletter* resurrects the continuing controversy over use of chaperones in the examining room. Gerald C. Zumwalt, MD, Secretary of the Oklahoma State Board of Medical Licensure and Supervision, wrote the editorial reprinted from Vol. 11, No. 2, May 2000 issue of the Board's newsletter, *Issues and* Answers, addressing the problem of persistent use of outdated and/or useless medical technology. Then a reprinting of the Q&A feature from a recent *West Virginia Board of Medicine Newsletter* quoting AMA opinion 8.19 entitled "Self-Treatment or Treatment of Immediate Family Members" and the Board's own rule regarding self-prescription and prescription to family members of controlled substances.

To my reading it only prohibits licensees, in limited and closely defined circumstances, from actions by which they "...prescribe or dispense any controlled substance on Schedule II through V for the licensee's personal use, or for the use of his or her immediate family *when the licensee knows or has reason to know that an abuse of controlled substance(s)* ***is*** *occurring, or may result from such practice* (emphasis mine)." While this obviously bars self-prescribing of controlled substances, it apparently allows evaluation, diagnosis and prescription of controlled substances for family members. Of course the ever-present danger here is diversion of narcotics for personal use by the physician spouse or parent, to my knowledge never condoned by any medical licensing authority.

Henry Mortimer, who replaced Catherine Canning as editor of *Physician's Practice Digest*, graciously allows us to reprint three articles from his magazine, one on opting out of managed care, another an interview with the president of a company which assists physicians opting out, and finally one on the dangers of managed care companies' provider capitation contracts with examples of how some physicians are voiding them.

As usual we encourage submission of letters to the editor, articles and guest editorials for publication consideration. Letters are subject to editing only for space requirements with articles and editorials typewritten and double-spaced. Free reprints of individual past *Newsletter* articles are available to members upon submission of a SASE, back issues for $10.00 each or $20.00 per volume of four issues. A 44 page monograph entitled "The Impaired Physician" and containing the complete series of articles previously published in the *Newsletter* is available for $20.00 including tax, shipping and handling, $15.00 to Society members. A new monograph entitled "The Ninth Commandment: Providing Effective Medical Expert Witness" is available for the same price. Books reviewed in the *Newsletter* as well as an audio cassette tape of the Society's 2000 ACM presentation "The Impaired Physician" are available at no cost to members through the Society's lending library.

All opinions expressed in *The Medicolegal OB/GYN Newsletter* are strictly those of the bylined authors and do not necessarily represent policies, opinions or recommendations of the American Society of Forensic Obstetricians and Gynecologists, its members, Board of Directors, Editorial Board, etc.

THE MAIL BOX

11 MAY 2000

Dear Doug,

Having read Dr. Harris' article ("Everyone's worst obstetrical nightmare"), I can't help but respond. Given that this newsletter's audience includes physicians who may find themselves involved in litigation one way or another, it seems wise to use caution in publishing any recommendations that might suggest a particular "standard of care." Since you provide this forum to discuss these issues, I wish to make the following comments.

First, it is unclear as to what the cutoff should be for a one hour glucose screen and there is an abundance of literature that suggests a blood sugar of 140 mg% should be used, above which indicating the need for a three hour glucose tolerance test (GTT). I do not think a level of 135 mg% "***requires***" a GTT (author's emphasis).

Second, that an obstetrician should be in attendance constantly during the course of labor is hardly an accepted standard. It is hard to believe that such attendance during labor (average duration fourteen hours for a primiparous patient) would decrease the likelihood of shoulder dystocia, let alone be universally practiced.

Third, it is most interesting to see a recommendation to perform a generous mediolateral episiotomy to help manage what is obviously a problem of bony dimensions. There exists no evidence that such a procedure, in increasing soft tissue dimensions, has any impact on managing shoulder dystocia.

Fourth, it is hard to imagine that anyone would actually provide anesthesia to a patient, surgically open the abdomen, incise the uterus and then continue an attempt at previously failed vaginal rather than abdominal delivery. I understand this was actually reported in the literature, but that was a case in which the head was already delivered and could not be displaced via the Zavanelli maneuver.

Finally, authors such as Delpapa, Lipscomb and Rouse are appropriately quoted in the article, yet their conclusions are collectively ignored in the recommendation that "elective Caesarean section may be the preferred route of delivery with EFW ≥4250 grams on ultrasound," in the absence of the diagnosis of gestational diabetes and any other obstetrical indications for Caesarean.

Elliot M. Levine MD

30 MAY 2000

Dear Elliot,

Thanks for your letter. We first need to realize there are two separate though related issues involved. The Society and its *Newsletter* do not define the nationally applicable minimum acceptable standard of care. We have from the outset tried to alert all our members to practice behaviors which put them at unnecessary risk of medmal litigation, based primarily on the experience of those of us who review cases as medical expert witnesses for defense and plaintiff. It makes no sense to persist in methods of practice which have been indefensible at litigation; it's much smarter and cheaper to learn from the mistakes of others. We have also tried to keep members who act as medical expert witnesses aware of frequently encountered methods of clinical practice which, though above the minimum standard in the past, are no longer considered by most to meet this standard in today's changing climate of improving medical care. I like to think both continuously improve the quality of care we deliver to our patients, as should be the case.

Of course you're right about the cutoff values for glucose challenge tests; they are arguable though not necessarily unclear. In spite of a wide spectrum of opinions in the literature, the College recognizes a range of 130 mg%-140 mg% as the sentinel value for a plasma blood glucose concentration one hour after an oral 50 gram glucose load. Technical Bulletin No. 200, December 1994, on diabetes in pregnancy says 140 mg% will miss 10% of gestational diabetics and 130 mg% will correctly identify almost all. As a minimum acceptable standard of care, using 140 mg% is acceptable. For best quality of care and improved risk management, use 130 mg%. Bruce feels strongly that 135 mg% is the most practical value to use, but that's his opinion. I agree. According to the 20th edition of Williams Obstetrics, using the 130 mg% value will expose 25% of those considered to have an abnormal glucose metabolism to a three-hour GTT which will be normal. The trade-off is every gestational diabetic is properly and timely diagnosed, certainly important information to consider in antepartum treatment and intrapartum decision-making regardless of route of delivery.

As to attending patients in labor, far too many babies, mothers and lawsuits are lost simply because nobody was minding the store. It's impossible to reasonably argue that having a competent obstetrician present in L&D 24/7 would not markedly improve the quality of care our patients receive. More and more hospitals are realizing this and providing such coverage. In case you haven't heard, the VBAC controversy has already reached this point and I'm convinced the rest of our practice will soon follow.

It's impossible to convince a jury that L&D nurses are as capable of managing obstetrical complications as obstetricians. If your skills are no better than those of your L&D nurses, you shouldn't represent yourself as an obstetrician. Juries and patients expect a much higher level of expertise from MDs than RNs. That's how we justify our higher professional incomes. Our patients didn't enter into a fiduciary agreement with the L&D nurses, they chose us. This doesn't mean every obstetrician has to remain in L&D when he has a patient in labor, but at least one of us should be present at all times. Perhaps not nationally recognized minimum acceptable standard of care yet, but certainly good patient care and good risk management.

I personally haven't cut a mediolateral episiotomy since my third year of medical school, instead preferring the midline incision and having used it extensively with too many fourth degree repairs to remember. While working in a busy residency training program I was asked by the department chair why we were having so many shoulder dystocias and subsequent Erb's palsies. The only difference I had seen was a marked reluctance by the residents and midwives to cut episiotomies, even after encountering difficulty with delivery. If you carefully read the several maneuvers for resolving shoulder dystocia, it seems to me impossible to perform these without getting room for your hands to work inside the vagina. Most of the older obstetricians who have been successfully managing shoulder dystocias for years will tell you the first thing they do is cut a liberal episiotomy if they don't already have one. Not to get additional room for the fetal shoulders but to get room for their hands inside the birth canal. As to mediolateral vs. midline, its a matter of what you're best at repairing, but the important point is to cut episiotomies early and big when trying to resolve shoulder dystocia in order to avoid preventable fetal and maternal trauma.

I certainly agree that laparotomy and hysterotomy seem an extreme solution to failed vaginal delivery of a shoulder dystocia, but the thing to remember is do whatever it takes to get the baby out quickly with the least trauma. If the head is hung-up and I'm trying an emergency Caesarean section after everything else has failed, I'll have someone try to complete the vaginal delivery, if it can be done easily, before I drag the infant back up through the birth canal and through the uterine incision.

I interpreted Bruce's statement on delivery of infants with EFW ≥9 lbs. to be a justification for elective Caesarean section without trial of labor, not a demand for abdominal delivery. Since contemporary philosophy on mode of delivery is approaching patient choice anyway, it only seems prudent.

Doug

12 JUNE 2000

Dear Doug,

Thanks for sending Elliot's objections to my shoulder dystocia essay. You so elegantly and completely expressed my intended response that I have nothing further to add. Aging robs one of younger men's relish for vigorous dissent.

Bruce Harris

THE HOT BOX

S.O.P.

by Doug Daniel

On the slim outside change you missed it, the College now recommends HIV screening for all prenatal patients, not just those thought to be at greater than average risk. Making such screening Standard Operating Procedure (S.O.P.) is a good idea long coming since routines leave less chance for inadvertent omissions. It should be a no brainer during an epidemic of a 100% fatal highly communicable disease. I decided at the start back around 1985 there was no way to separate patients at risk from those not since everyone who ever had sex was at risk. Some behaviors put one at greater risk such as male homosexual anal intercourse and shooting drugs, but everyone is at risk. Now apparently the feds and the College agree.

Interestingly, there is no advocacy for extensive informed consent with pre- and post-test counseling as has been utilized all along in some states such as New York. There's also no great shakes about confidentiality. In fact, according to *ACOG Today*'s May/June 2000 issue:

> "ACOG is stressing that as a routine part of prenatal care, every pregnant woman, regardless of her apparent risk for HIV, should be tested for evidence of the infection, along with being informed that the test will be run. The test would not be mandatory - any woman could refuse HIV testing - but ACOG hopes its campaign will make HIV testing as run-of-the-mill in prenatal screening as urinalysis."

This is called "universal, routine testing with patient notification" and is apparently being pushed hard by the Feds' Institute of Medicine and Centers for Communicable Disease Control. In some states this is however illegal since it violates long-standing consent and confidentiality requirements, so check with your local medical society or health department. These local restrictions will probably change to become compliant with federal policy.

I've never understood why HIV testing should be handled any differently than tuberculosis screening, certainly no differently than previously state-mandated tuberculosis and syphilis screening without options for patient refusal such as every hospital admission or various public licensing procedures. When it does truly become routine and free of patient consent, even coerced with mandatory treatment and follow-up, we will finally begin to get an epidemiologic handle on this 21st century plague. Until then, *cave canim*.

THE BOOK BOX

DOCTOR DEATH:
THE ULTIMATELY IMPAIRED PHYSICIAN

by W. Benson Harer, Jr., MD

"When a doctor goes wrong he is the first of criminals. He has nerve and he has knowledge."

Sir Arthur Conan Doyle
In "The Speckled Band", 1891

A Prescription for Murder: The Victorian Serial Killings of Dr. Thomas Neill Cream
Angus McLaren
Illustrated. 233 Pages. Chicago:1993
University of Chicago Press
Springer-Verlag
Paper, $12.95

One of the earliest known serial killers was Thomas Neill Cream, MD, hanged 15 NOVEMBER 1892 at age 42 years for the murder (by surreptitiously giving them oral arsenic represented as legitimate medication) of four London prostitutes. Cream most likely was responsible for the premeditated murders by poisoning either with arsenic or chloroform of at least five others in North America including his Canadian wife and four of his US patients in addition to untold London prostitutes. One of his patients so dispatched was a paramour's elder husband and Cream intended to subsequently profit from an unsuccessful blackmail scheme threatening the victim's pharmacist with being revealed as the poisoner. Cream was much more successful at murder than extortion or blackmail.

Born 27 MAY 1850 in Glasgow, Scotland, Cream emigrated with his family to Montreal, Canada, in 1854 where his father prospered in business and young Thomas taught Sunday School. In March 1876 he received after four year's study the MD degree from Quebec City's McGill College, presenting his graduation thesis on the pharmacological properties of chloroform. The occasion's speaker addressed the graduates on "The Evils of Malpractice in the Medical Profession".

Shortly after his graduation and prior to sailing for England to continue his medical education at St. Thomas's Hospital, London, Cream's fiancee became ill and her father discovered she was experiencing complications of a recently induced abortion performed by person or persons unknown, assumed to be Cream. A literal "shotgun wedding" was quickly performed before Cream's embarkation, but less than a year later the newly wed Mrs. Cream died following a short illness with suspicious symptoms which were treated with pills mailed by her husband from London.

During his studies at St. Thomas's Cream was exposed to Dr. Albert James Bernays, professor of chemistry and a medical expert witness for the Crown Prosecutor in a high-profile trial charging murder by strychnine poisoning. The case had been difficult to solve due to the lack of uniformity in British coroner inquest law, the prestigious *British Medical Journal* opining that as a result many violent deaths by poisoning were probably going uninvestigated.

Cream also took advanced training in obstetrics at St. Thomas's while Lister sprayed carbolic acid around the operating rooms at nearby General Lying-In Hospital, but in 1877 the young Canadian obstetrician failed his anatomy and physiology entrance examinations for the Royal College of Surgeons. The following year he was admitted to the Royal Colleges of Physicians and Surgeons, Edinburgh, with a midwifery license and in May returned to London, Ontario, where he opened an obstetrical practice. Following the death of a patient from an overdose of chloroform suspected to have been employed as an anesthetic for elective abortion (her body was discovered in the outhouse behind his office), Cream hastily crossed the border to Chicago and was licensed by the Illinois State Board of Health in August 1879, promptly opening a medical office in the city's busy red light district.

Cream had long been known as a womanizer and frequent consort of prostitutes, and it was common knowledge he provided abortions. Another patient was discovered dead and decomposing in a rooming house, apparently following postabortal sepsis. Arrested and charged with murder, Cream was acquitted primarily due to the skill of his defense attorney and the fact that the state's only witness was a "colored" lay midwife who occasionally assisted him. After the death of a third female patient under suspicious circumstances, failed

blackmail and extortion schemes, a sordid libel attempt, and the recent poisoning of his cuckold patient noted above, Cream hurriedly left Chicago and returned to Canada.

Within a month he was arrested in Belle Riviere, Ontario, taken to Windsor for questioning and extradited to Chicago to stand trial for the murder of his mistress's husband. He was again tried for murder, this time convicted in September 1881 and sentenced to life imprisonment in Joliet State Prison with at least one day a year to be spent in solitary confinement. Ten years later Illinois Governor Joseph W. Fifer granted Cream executive clemency with release in July 1891.

Returning to Canada and collecting a modest inheritance, Cream then set sail again for London where he took rooms across the street from St. Thomas's Hospital but never again practiced medicine in the traditional sense. He did represent himself to acquaintances and potential victims as a physician, even offering pills he compounded himself for their various symptoms. Cream quickly became a frequent customer of the many prostitutes working nearby, claiming multiple sexual encounters in an evening, and was known to be obsessed with pornography. He also became a regular user of opium, morphia, cocaine and beverage alcohol to excess.

Following the deaths of two prostitutes shortly after being seen with Cream he once more left town and sailed to Canada, but returned to London after three months and again took lodgings among its prostitutes in the entertainment district. Two more of his female acquaintances subsequently died of arsenic poisoning. On 3 June 1892 he was arrested by Scotland Yard on charges of blackmail, on 18 July charged with murder in the deaths of four prostitutes, during 17-21 October tried by the Crown in Old Bailey court rooms, on 21 October found guilty after ten minutes' deliberation by a jury of his peers, immediately sentenced by the presiding judge to be hanged by the neck until dead and God's mercy invoked on behalf of his soul, and executed 15 November at Newgate Prison.

In the finest police tradition Scotland Yard took full credit for the investigation and arrest, yet McLaren clearly shows it was Cream's own hubris in calling attention to the murders (first officially dismissed as suicides or food poisonings) coupled with the prostitute community's coordinated and persistent efforts to protect itself that led to his capture. McLaren has not written a deep, psychological analysis of the serial murderer's criminal mind but instead an historical and social analysis of moral, economic and political conditions during the late 1800s which fostered or at least allowed Cream's professional failure, ever-deepening descent into moral degradation, and eventually prolonged macabre crime spree.

The author examines quite well the role society then demanded for women in general, prostitutes in particular, and the subsequent changes in its views of crime, law enforcement, and the judicial system regarding punishment of criminals and the status of women. Since God dictated the Ten Commandments to Moses murder has been recognized as the ultimate crime against person with, over the last 150 years, serial killers filling a special niche. Prostitutes have always comprised a remarkably large number of their victims. Undoubtedly society's attitudes toward commercialization of sex in general and prostitutes in particular have made their victimization much easier.

The first half of McLaren's book, summarized above, is a straightforward factual account of Creams' life such as it was. It avoids sensationalism, conjecture and interpretation as much as possible while holding the reader's attention with its well-written historian's commitment to detail and chronology. One shouldn't be surprised as McLaren, professor of history at the University of Victoria, Vancouver, British Columbia, is an established author on scholarly topics both historical and social.

The second half is less like a yellowed, dog-eared copy of an old *Police Gazette* or *New York Daily News*, more interesting and intellectually challenging as McLaren skillfully reweaves the fabric of life at the turn of the century. That era's women tried to control their fertility by using contraceptives or seeking elective abortions while various moral and legal authorities simultaneously tried to either aid or frustrate such efforts. He describes law enforcement's progression from apprehension of criminals after the fact to surveillance of potential perpetrators, crime prevention, and finally actually promoting crimes through enticement and entrapment in order to make arrests. He also explains how during the late 1800's revolutions in cheap communication and transportation such as widely distributed periodicals, reliable public mails, anonymous post office box addresses, mimeographs, plus fast steamships and trains made both legitimate and illegal activities more easily and efficiently conducted. One hundred years later satellites, personal computers, the Internet and jet aviation have remarkably done the same during the last 20 years of our century.

Suffragettes and other activists fighting for the electoral, personal, legal and property rights of women both married and single threatened an already unstable status quo. Other studies of late 19th century society have focused on England, but Cream's exploits in Canada and the US give us a distinctly American view of similar problems for women on this side of the Atlantic. Devout feminists will find much for justified outrage here.

Our concepts of criminal behavior, motivation, genesis, control, punishment and rehabilitation remain even today far from providing effective preventatives. Disparities in legal and societal status of women remain with us as do prostitution and exploitation. Women, especially prostitutes, continue to be the prime victims of murderers, rapists, assaulters, batterers, muggers and other violent criminals with little protection except what they themselves provide. Control of their sexuality and fertility remains hotly and sometimes violently contested. Serial murderers continue to own the headlines on occasion. McLaren contends that Cream and his crimes are best understood as the products of an already sick Late Victorian society and he won me over with his arguments. Other readers may find alternate explanations. A Prescription for Murder is available from your local or Internet bookseller or directly from:

The University of Chicago Press
Order Department
11030 South Langley Avenue
Chicago, Illinois 60628
Phone: 1.800.621.2736
Fax: 1.800.621.8476
Email: kh@press.uchicago.edu
Website: www.press.uchicago.edu

Editor's Note: Lest anyone think Cream's crime spree an aberration of the benighted past impossible to be repeated today, on 31 JANUARY 2000 fifty-four-year-old London family practitioner Dr. Harold Shipman was sentenced to 15 concurrent terms of life imprisonment after being found guilty of injecting 15 of his elderly female patients with fatal doses of heroin. Twenty-three other similar charges were considered by the Crown Prosecutor but not yet brought, and police estimated that over a 30 year professional career as many as 200 similar deaths had been caused by the reportedly mild-mannered father of four described in news accounts as a country doctor who took pride in still making house calls on his more than 3000 patients. Shipman was know to have attended all his victims shortly prior to their unexpected deaths, previously assumed to have been due to natural causes and therefore not subjected to autopsy. The trial was confined to murders known to have been committed by Shipman between March 1995 and June 1998. If correct, his estimated 200 poisonings easily make him Britain's worst known serial killer ever, if not the world's.

Like Cream before him, Shipman was also an inept con artist whose amateur attempt at fraud became his undoing. The killing spree was only discovered when one of his victim's lawyer daughter became suspicious of a poorly forged signature on her mother's newly but crudely typed will leaving a $626,000 estate to Shipman. The police did not begin their investigation until the daughter presented them the results of her own two week investigation which made an irrefutable case for murder. Shipman also shared Cream's history of narcotic addiction, being convicted in 1976 of forging meperidine prescriptions to support his own habit.

Compiled from news accounts published by abcNEWS.com, CNN.com and Reuters Limited.

THE SUGGESTION BOX

POLITICALLY INCORRECT

by Doug Daniel

It seems everyone has an agenda these days: Save The Whales, Ban the Bomb; Woman's Right to Choose, The Unborn's Right to Life; Balance the Budget, Save Social Security; Tax the Rich, Feed the Poor; Equal Pay For Equal Work, Affirmative Action; etc. ad nauseum. Now there appears to be a resurgence in the movement to Ban the Episiotomy. To reprise one of this year's Academy Award nominees for best original song, "Blame Canada". If the next fifty years produce a labor market glut of elevator operators, street sweepers, Whopper® Whizzes ("You want fries or a pie with that?"), incontinent female bladders and prolapsed uteri, it ain't gonna be my fault!

Two recent issues of the green journal (March 2000 page 464 and April 2000 page 616) published articles from the same Canadian authors bashing episiotomy as the scourge of modern woman and an assault upon her sacred perineum by cruel, deranged misogynists fraudulently posing as caring and concerned obstetricians.

The two authors of the April article are apparently women. These same two are co-authors of the March article along with two men. One of the males is a PhD, probably a statistician or maybe even a nuclear physicist for all I know. The other is apparently an allopathic general practitioner. Both females hold MDCM degrees, whatever that is, while one is associated with a university's department of family practice and the other with another university's department of obstetrics and gynecology. All are from north of the border.

Certainly every editor including yours truly gives his publication a certain flavor which reflects personal beliefs and professional opinions. Nonetheless there is a responsibility, especially in professional journals and most especially in respected medical professional journals, to clearly identify biased opinion pieces as such and fairly provide legitimate opposing arguments from the other side. This makes for a balanced presentation and allows the readers to individually reach their own conclusions. Otherwise the publication loses whatever objectivity or credibility it had in the first place, instead becoming simply a propaganda organ for unfounded, minority, socially-driven rhetoric.

Some might say one has only to consider the source in determining how much credence to place in biased reporting, but the neophyte professional is easily swayed by any and every new idea that comes sauntering down the pike regardless of whether it's reasonable or not. The media sharks are not only more gullible in their relative ignorance but even voracious in their feeding frenzy searching for exploitative exposés to sell lots of papers or snatch a Pulitzer. Of course there's a tendency among older and more experienced obstetricians to resist accusations that they've spent their life slicing up their patients to no useful benefit, instead causing unnecessary complications and permanent disabilities. I've never believed any of this garbage. Over the past few years there's been an increasing stream of touchy-feely social opinions, bean-counting tight-fisted financial cutbacks, and gender-bending sexual politics presented as "evidence-based" academic medical research on controversial and unfathomable topics whose answer is known only to God and He ain't talking. These include anesthesia for all newborn circumcisions whether or not it works, Caesarean sections for everybody whether or not they need them, VBACs for everybody whether or not they want them, steroids and tocolytics for everybody and forever whether or not they work, home uterine activity monitoring whether or not it works, routine electronic fetal monitoring in labor for everybody whether or not it makes for better babies, routine elective outlet forceps delivery whether or not it permanently scrambles female pelves like cheese omelets and cracks fetal heads like walnuts, vacuum extraction delivery whether or not it bloodies babies brains, prepartum identification of macrosomic feti and their subsequent delivery by Caesarean section whether or not it prevents serious newborn injuries and permanent disability from shoulder dystocia, and epidurals for everybody in labor whether or not they kill mothers. Jesus, Mary and Joseph, will this never stop?

It seems for every article advocating one of these there's another decrying their use. Has anyone stopped to consider that just maybe we don't know what in the Hell we're doing and there's no 100% right answer all the time for everybody? This used to be what was referred to as "the art of medicine". You were trained in your profession by older and more experienced physicians who had had years to consider what was best for their patients, having seen the undesirable consequences of some innovations and the proven value of others. Today it's a cookie-cutter approach making the bottom line as lucrative as possible for the fewest investors while embracing this year's politically correct trend.

Let's take a closer look at three of these controversies: anesthesia for newborn circumcision, Caesarean section on demand and routine episiotomy. I've been troubled by the dust-up over circumcision anesthesia from the outset. I read the position paper published by the College and the American Academy of Pediatrics. I've almost finished reading all their quoted references plus many others. So far everything seems to be based on two or three long-ago studies on pain in newborns which were so subjective I don't know how anybody in their right mind could cite them as the basis for an argument to radically change traditional social mores and religious rites. I know

among pediatricians there has been a minority opposition to circumcision under any circumstance for a number of years. I still don't see any convincing evidence for or against newborn circumcision or its need for anesthesia. Why not leave circumcision up to the parents and anesthesia up to the surgeon?

Back when I was a resident in the 70s the guys at the prestigious Yale Medical School stopped just short of advocating Caesarean section for everyone by predicting it would eliminate neurologically damaged infants, traumatically injured infants and stillborns. Everybody else laughed them out of town as idiots and no more was said for years. Now we see a resurgence of a similar philosophy based upon patient autonomy. The current College President, our own Ben Harer, stole the show with the lead article in the March/April 2000 issue of *ACOG Clinical Review* with a logical, well thought-out and cogently presented editorial argument in favor of such autonomy that was pretty much bomb-proof. Within a month the popular ladies' mags had picked-up on it and even quoted Ben. If that doesn't convince you, wait until you read his inaugural address (assuming you missed it in person). Today maternal and fetal risks/benefits are about the same for vaginal and Caesarean delivery, so why not? An unrecognized benefit is patient-elected Caesarean section will probably eliminate those injuries both maternal and fetal caused by many of our colleagues' lack of attendance, attention, or ability during their patients' labors.

Now what about episiotomies? My training was that every routine obstetrical patient got a tetracaine saddle block anesthetic, early and adequate midline episiotomy, and elective low forceps delivery. If not you damn well better have had a good explanation at morning report. Consequently everyone finishing my program was well-versed in all three. Total Caesarean section rate was about twelve percent primarily due to vaginal breech deliveries, midforceps rotations and deliveries, no ultrasound and very limited EFM. We almost never saw a significant shoulder dystocia and Erb's palsy was practically nonexistent. Since we did a tremendous number of midline episiotomies and repaired uncounted fourth degree lacerations, complications related to episiotomies were almost non-existent.

I remember only one significant complication over four years, a chief petty officer's wife whose episiotomy broke down after I repaired it with the usual 00 chromic. No evidence of infection, essentially a wound dehiscence. The chief of the department took her to the operating room about two months postpartum and I helped him do a meticulous repair, again with 00 chromic. This one also dehisced and he decided she was not tolerating the suture material. She was offered a third repair with inert suture material such as cotton or monofilament nylon but refused. The last I heard she had an intact anal sphincter with fecal continence but a gaping introitus which was granulating in and healing by secondary intention.

At their postpartum visits it was quite difficult to differentiate patients' perinea from those of sexually active nulligravidas in the routine gyn clinic. Good support of the pelvic floor, good support of the anterior and posterior vaginal walls, firm and well-supported perineum, good anal sphincter tone. Usually there was noticeable dilation of the vaginal vault but otherwise very normal anatomy with good physiologic function.

Today we instead read of fecal, flatal and urinary incontinence blamed on episiotomy with EMGs and ultrasounds demonstrating damaged perineal nerves and anal sphincters after episiotomy. Why all of a sudden this change ? I discovered the answer while working in a large residency training program. Due to a failure of attendings to use and teach repair of episiotomies, today's residents don't know how to properly repair an episiotomy and therefore avoid them like the plague. When they do occasionally have to repair one or a fourth degree laceration, they don't recognize the anatomy and more or less just throw it back together. Like the midwives, they avoid episiotomy at all costs, thereby allowing unbelievable traumatic tension to the perineal nerves and musculature until a spontaneous obstetrical laceration occurs or they cut a minimal episiotomy at the last possible moment.

Some, like our neighbors to the north, now advocate abandonment of episiotomy and forceps delivery in favor of the kinder, gentler Caesarean section. My question is, if we have failed to teach our residents proper and proven techniques of newborn circumcision, vaginal breech delivery, operative vaginal forceps delivery, and episiotomy and repair due to concern over medmal liability and non-obstetricians' opposition, what makes us think we will teach them how to do a proper and safe Caesarean section?

THE BALLOT BOX

CAMPAIGN 2001

by Doug Daniel

It's that time of year again. The latest issue of *ACOG Today* announced next year's candidates for College office and it's a pretty fast track. There's a wide selection of Fellows for almost every office except Secretary where the incumbent is running unopposed, as is usually the case. All are extremely well-qualified.

Having carefully perused the candidates' qualifications, those of us here at the Society's editorial offices have finally decided upon our endorsements, as every responsible editor should. Charles B. Hammond is our choice for President Elect. He's been widely known for a number of years as an outstanding clinician and researcher, essentially blazing the trial for modern theory and therapy of gestational trophoblastic disease in addition to establishing one of the first and best gestational trophoblastic disease research and treatment centers. Not only that, he's been at Duke's medical school since Bingo was a pup and has been chair of their department for longer than I can remember, immediately following Roy Parker's long and illustrious reign unless I'm mistaken. Not only that but I can't remember when he wasn't heavily involved in District IV's affairs, which he now chairs in addition to the Council of District Chairs. A true thoroughbred.

I was also excited to see Douglas W. Laube's hat in the ring for both Vice President and Assistant Secretary. Doug's written a dynamite article for the September *Newsletter* on discrimination and abusive behavior directed toward physicians in training by their seniors and attendings. He's currently chair of his department at the University of Wisconsin and a past chair of CREOG. A more detailed summary of his background will be presented in conjunction with the article, but I can tell you I've never worked with a more professional and professorial physician. It's no surprise he runs with the best of our specialty's resident education big dogs.

Of course the ultimate decision on nominations rests with the Committee on Nominations consisting of one representative from each district plus the last two Past Presidents. If you have any Committee member's ear, carefully consider these candidates and tell folks what you think.

THE LITTER BOX

WHO CARES?

by Doug Daniel

Upon returning from the recent San Francisco ACM an envelope with the College's return address was found cozily snuggled into the middle of a voluminous pile of waiting mail. It contained an "Executive Summary of *Evaluation of Cesarean Delivery* developed by ACOG's Task Force on Cesarean Delivery Rates" and a nice cover letter from Stan Zinberg, Vice President for Practice Activities at the College. The gist of it was that the College had summoned to DC a select group of our specialty's Wise Men, Wizards, Viziers, Seers, Prognosticators and other Prominent Palace Poobahs from the East, the West and various points in between to task them with divining future goals for US Caesarean section rates.

Certainly an admirable aspiration, determined with amazing accuracy to be 15.5% for "Nulliparous women at 37 weeks of gestation or greater with singleton fetuses with vertex presentations" and 30.3% for "Multiparous women with one prior low-transverse cesarean section delivery at 37 weeks of gestation or greater with singleton fetuses with vertex presentations." Pretty impressive stuff until I remembered Ben Harer, incoming ACOG President, had only a few days earlier publicly gone on record as advocating unfettered patient autonomy in choosing between elective vaginal or Cesarean delivery, presumably with the caveat that we were still responsible for recommending Caesarean section when indicated to those choosing trial of labor and delivery via the vaginal route.

More to the point, Ben's stated position in his front-page editorial for a recent *ACOG Clinical Review* plus his inaugural address and its presumed reproduction in a soon-to-be-published issue of the College's official clinical publication *Obstetrics and Gynecology* have pretty much made targets for Caesarean section delivery rates *passé*. It can certainly be argued that Ben was only expressing a personal opinion but the personal opinion of ACOG's President, while perhaps not College-approved policy, obviously carries quite a bit of weight. Add to this the fact that anyone opposing increased patient autonomy in choosing clinical management of their pregnancy will look like a benighted Neanderthal suppresser of the liberally sacred Woman's Right to Choose and the decision on whether to support or oppose Ben's position becomes a no-brainer.

There will almost certainly be a covert backlash, probably from older, more traditional obstetricians and the aforementioned Task Force. The third-party-payors who don't already will soon start reimbursing a flat rate for global obstetrical care regardless of mode of delivery since their only concern is benefit costs. Unprecedented numbers of medmal plaintiff attorneys will have to line-up for welfare checks and food stamps because they will be deprived of one of the most rewarding allegations in their *repertoire*, mismanagement of labor with a subsequently neurologically damaged infant. Most patients will seek an obstetrician who will accede to their wishes regarding mode of delivery but a few will still expect him to make difficult decisions for them. Bottom line? Patients enjoy increased autonomy in their medical care with the option of avoiding dreaded, prolonged, painful and dangerous labors with mutilation of their feminine charms; obstetricians get some long-sought-after relief from exorbitantly expensive medmal allegations of negligent management of labor; babies face less risk of intrapartum hypoxic brain damage due to ignored abnormal EFM tracings. Seems to me like a win-win situation for everybody except the lawyers, and who cares anyway if they all starve like the Donner Party with no alternative but cannibalism.

LIFE ON THE EDGE: PRETERM BIRTHS AT THE LIMIT OF VIABILITY, Continued From Page 1

then considerable effort has been expended at both state and national levels to do both as means to reduce preterm and VLBW birthrates. Among strategies undertaken were loosening Medicaid's restrictions on eligibility for and increasing benefits to pregnant women, the national Healthy Start Initiative, infant and fetal death reviews, and the Women and Infants Care Program (WIC).

Subsequent evaluations of this Medicaid expansion produced mixed results: Medicaid enrollment increased while early registration for and quality of prenatal care rose.[12.-15.] Since the early 1980s there has been a greater than 6% increase in registration for prenatal care during the first trimester.[16.] The incidence of adequate prenatal care has increased nearly 40% while inadequate prenatal care has decreased by a third.[16.] Despite these remarkable achievements in improving early access to and delivery of quality prenatal care, no corresponding decline in preterm or VLBW birthrates has occurred.[1.,16.]

By 1995 a Future of Children report on LBW births concluded that contemporary prenatal care did "little to prevent low birth weight or preterm birth".[17.] More recent reviews have also concluded that little is done during routine prenatal visits to effectively reduce the risk of VLBW or preterm delivery.[18.-20.]

Researchers are now looking closely at factors thought to be responsible for the decrease in our infant mortality rate during this period of rising preterm and LBW birthrates. Given the lack of positive changes in birthweight and gestational age distributions, the reduction in infant mortality rate appears to be almost entirely the result of increased birthweight- and longer gestational age-specific survival[21.-24.] with the greatest increase in survival among LBW and preterm infants.[21.,22.] This improvement in infant survival likely reflects technological and clinical care developments in perinatology and neonatology. Antenatal maternal corticosteroid dosing[20.], neonatal steroid and surfactant administration, plus mechanical and high frequency ventilation of neonates[25.] have all been linked to the decreased incidence of gestational age-specific neonatal mortality as well as RDS. Regionalization of high-risk perinatal services has obviously facilitated access to such advanced care.

The reliance on development and application of more sophisticated medical technology to further reduce infant death rates begs two questions.

> "Can we depend on future breakthroughs to further reduce our infant death rate?" This question was first raised back in the early 1980s, before such therapies as neonatal intratracheal surfactant administration were even envisioned.[24.] Nonetheless it has reemerged as the age of viability, defined as the gestational age at which 50% neonatal survival is expected, has been lowered to nearly 23 weeks.[4.,5.,21.,22.,26.] It is today unclear whether further appreciable reductions can be achieved without development of an artificial extracorporeal womb.
>
> "Can we afford to continue our technology-dependent approach to further reduce the infant death rate?" We all pay for expensive medical technology through rising insurance and other healthcare costs while the potential benefits of prevention strategies loom as increasingly attractive alternatives. It has indeed been recognized that if reductions in infant mortality rates are to continue while related health care costs are controlled, we must focus on prevention of preterm births.[2.]

In order to enjoy continued reductions in preterm birthrates a better understanding of factors thought to underlie their increase here in the US is needed and several have been studied.[21.,22.,27.] Some of the recent increases in preterm and VLBW birthrates may reflect changes in vital record reporting, i.e. very small infants once reported as fetal deaths may now be registered as live births or methods of estimating gestational age may have changed. Other possibilities to explain these rising rates include:

1. Increasing incidence of multiple gestations and births,
2. Changing maternal demographic characteristics such as increasing mean age of mothers,
3. Increasing use of and technical improvements in diagnostic obstetrical ultrasound, and
4. Increasingly early therapeutic termination of pregnancy by any and all means.

Earlier and better prenatal care coupled with new clinical and technological discoveries in perinatology and neonatology such as neonatal intratracheal surfactant administration, antenatal maternal corticosteroid dosing and improved antepartum fetal testing may lead to earlier diagnosis and therapeutic preterm delivery to further decrease maternal, fetal, and even infant mortality/morbidity rates by increasing the safety of moderately preterm delivery for complicated pregnancies.

Our grasp of the possible factors increasing preterm and VLBW birthrates is actually better than our understanding of how to reduce these rates. Furthermore, the clinical practice and demographic factors that could be increasing these same rates may simultaneously be hindering our efforts to identify any benefits of emerging prevention/intervention approaches and proposed enhancements of prenatal care for VLBW and preterm infants. Although many innovative prenatal therapies have been highly touted as reducing preterm and VLBW birthrates,

more rigorous studies have not shown them to be effective.[18.-20.,28.] Their lack of proven efficacy may only reflect our continuing inability to understand the etiology of preterm birth and thereby accurately identify pregnancies at risk for preterm birth.[28.]

During a recent conference on preterm birth prevention it was generally agreed that current knowledge of the multiple etiologies of preterm birth such as PPROM, spontaneous preterm labor and therapeutic preterm delivery may still be too meager to develop highly effective prevention or intervention strategies.[29.] Many previously recommended interventions such as traditional social support programs, more frequent prenatal visits and Home Uterine Activity Monitoring (HUAM) have had little or no impact on preterm and VLBW birthrates. Since preterm birth is a single outcome with multiple causes, such single-shot "bullet" solutions may simply not be feasible.[29.] Several options to support current and facilitate future efforts were still proposed at the conference, including:

- Improving coordination of preconceptional, prenatal, intrapartum and postnatal care;
- Promoting a "Woman and Family Focus" to all phases of obstetrical care;
- Increasing utilization of available therapies proven to be efficacious such as antepartum maternal corticosteroid dosing and group B strep prophylaxis;
- Increasing efforts to reduce tobacco use among adolescents in general and especially pregnant women; and
- Increasing efforts to control STDs.[29.]

Finally, early initiation of regular prenatal visits was heartily endorsed as integral to realizing prenatal care's many other potential benefits including decreased maternal/fetal morbidity and mortality, increased subsequent utilization of child healthcare resources and its future as the major vehicle for providing more effective interventions as they evolve.

While we develop new approaches to reduce preterm and VLBW birthrates some self-analysis of past efforts is also needed. Seeking medical care solutions and narrowly targeting interventions to high-risk populations often defined by immutable risk characteristics has been quite costly and possibly discouraged alternate strategies to build more functional, supportive community environments and explore the potential benefits of broad, population-wide social policies such as workplace safety and maternity leave. While obvious strides have been made in lowering both gestational age-specific neonatal mortality and the limits of viability, there have been formidable consequences considering the absence of corresponding reductions in preterm and VLBW birthrates.

Many more preterm and VLBW children are now surviving. Many of these survivors have normal outcomes without major disabilities. Very expensive perinatal and neonatal care clearly benefits them, but on a population-wide level the reality is that an appreciable proportion of survivors will have serious disabilities. The increasing number of preterm and VLBW survivors has important implications for utilization of future resources which will be unavoidably rationed. Throughout their lives they will be major consumers of finite healthcare, social service, insurance and special education resources. The costs associated with an extremely small (less than 1000 gms) or early (28 or less completed weeks of gestation) birth are over ten times greater than those of a term, appropriate for gestational age birth and include hospital, provider, early intervention, long-term follow-up, mental health and special education expenses.[30.,31.] In spite of the difficulties involved in reducing preterm birthrates, the financial consequences of not doing so are immense.

Our failure to allocate sufficient ingenuity and resources to discovering the mechanisms leading to premature delivery and thereby preventing preterm and VLBW births, when combined with our disproportionate investment in the development of sophisticated medical interventions which can only be employed at or around the time of delivery, may be a costly blunder we will not soon be able to rectify. The unreasonably high expectations of newborn parents, policy-makers and society at large have been fueled by biased media coverage glorifying each miraculous rescue of an extremely small baby without mentioning its long-term prognosis or cost. It may now appear to be a breach of medical ethics to even consider any other course than the most aggressive management possible for babies born too small or too soon. Unfortunately the excitement surrounding these "miracle baby" stories deters the necessarily frank, sober discussions of these children's' likely future and that of their families. As painful as these discussions may be it is even more difficult to ask whether we as a society are prepared to provide, at the cost of underfunding other healthcare programs, the life-long support necessary to care for infants born on the very edge of viability.

It may be time to temper the zeal with which we expend tremendous sums of money around and after delivery of preterm and VLBW infants until we can assure better than miserly care for other children with serious and persistent medical problems, chronic illnesses and disabilities. We should not continue to spend these extraordinary sums if we are unwilling to approach the prevention of prematurity with equal zeal and commitment of resources. Given that the pressure on obstetricians and neonatologists to maintain their aggressive management of these very early and very small newborns is unlikely to diminish, we must also be advocates for survivors and their families by working tirelessly to ensure that appropriate, necessary healthcare and social services will be available for the remainder of their lives. Until we are confident this will be the case it will be extremely difficult to engage in rational policy discussions regarding appropriate limits of viability, levels of individual intervention or societal investment.

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CAN SOCIETY AFFORD TO SAVE THESE BABIES?

by L. Joseph Butterfield, M.D.

As recently as 25 years ago, babies weighing 1000 gm or less at birth rarely survived, so the ethical and economic problems posed by their survival are relatively new ones. Starting in the 1950s and continuing into the 1960s, a series of reported cases indicated that 13% to 23% of these very small babies ***were*** surviving.

A 1963 report by Lula O. Lubchenco, M.D., and associates at the University of Colorado Medical Center covered approximately 187 admissions between 1947 and 1950 [*AM J Dis Child* 106:101]. All the babies weighed less than 1,500 gm at birth, and 94 died within a month. Of the 64 babies found for follow-up, 68% had some neurologic problem.

In the region served by Denver-based level III facilities - an area of 500,000 square miles including parts of ten states - we calculate that there are 70,000 women who are likely to deliver babies this year. Between 1% and 2% of these women will have babies weighing less than 1,500 gm. Frankly, if every mother decided to deliver at one of Denver's three intensive care perinatal centers, we would not be equipped or staffed to cope with them. The newborn center at the Children's Hospital in Denver admitted 129 babies weighing less than 1,000 gm in the years 1969 to 1974. Seldom do such babies have a smooth hospital course. For example, 1% to 2% may develop necrotizing enterocolitis. A baby with this acute condition usually has a distended abdomen because feedings are not well accepted, and an x-ray reveals gas in the wall of the bowel. Some babies respond to conservative treatment, but in others the gas causes bowel perforation, necessitating an immediate operation. The surgical challenge is to remove as little of the bowel as possible to avoid leaving the baby a gastrointestinal cripple.

Many babies weighing less than 1,500 gm at birth require assisted ventilation for respiratory distress syndrome. Several investigators have found that 17% to 68% of these babies develop bronchopulmonary dysplasia. The risk of developing BPD correlates with inspired oxygen concentration and the length of time the baby is on assisted ventilation.

Patent ductus arteriosus is often associated with low birthweight and respiratory distress syndrome. Usually, babies with patent ductus arteriosus can be managed conservatively with digoxin, diuretics, fluid restriction, and continuous positive airway pressure. However, approximately 25% of such babies require surgical ligation of the ductus.

Still another complication that may occur in the small premature infant is retrolental fibroplasia. Despite careful attention to oxygenation during intensive care, retrolental fibroplasia remains an enigma. In a series reported by M. Douglas Jones Jr., M.D., and Laurence J. Murton, M.D., B.S., 21 of 129 babies (16%) surviving on mechanical ventilation had some degree of the disease [*Pediatr Ann* 6:253, 1977]. Within the first year of life, this complication may cause myopia or blindness in severely affected babies.

There are many questions to be answered in deciding whether society can afford to save very small babies: How long can they be expected to live? Will they become competent adults, capable of effective interaction with their peers? We must also consider the family crisis caused by the birth of a less-than-normal child. Will the burden be too great for the parents, either economically or emotionally? Will their marriage survive? And how will the other children be affected?

What about society's priorities? Should its financial support go primarily to research and to preventive measures that may ultimately reduce the number of small babies? Or should most of our financial support go toward helping such babies thrive? Reason tells us that we need all three: research, preventive measures, ***and*** caretaking.

For nearly 100 years, increasing effort has been devoted to saving small babies. Many laboratory and technological advances have contributed to the improved survival figures we see today, but throughout this century the incubator has been the symbol of society's commitment to the welfare of premature infants. Developed in France, the incubator began to save the lives of babies at the turn of the century. This tremendous breakthrough in the care of infants became a public issue - people thronged to great scientific expositions to see the incubator and pass judgment on it.

By the 1920s, incubators had been designed for use in vehicles transporting babies from the hospitals where they were born to others offering specialized care. A technician trained in life-support measures accompanied the van. Today's life-support teams may include emergency care nurses, respiratory therapists, emergency medical technicians, and, occasionally, physicians. The cost of a well-equipped emergency transport vehicle may be as high as $75,000, which brings us again to the question: Is society prepared to help foot the bill for keeping our smallest babies alive?

Using both surface and air transport, the newborn emergency service based in Denver will undertake approximately 1,200 missions this year to pick up babies that local hospitals are not staffed or equipped to handle. The average cost for surface transport of a high-risk newborn is $300; the average cost of air transport is $1,100. And to fully equip a level III Neonatal ICU bed amounts to $19,000, not including staff expenses or doctor bills.

We must also be concerned about the cost to the family and to the hospital beyond that covered by insurance. The average hospital stay for small babies is 78 days, and the average cost of care comes to about $15,000; in some cases the bill runs above $100,000. And, of course, there are the emotional costs of morbidity and mortality borne by the staff.

While admitting that we need to increase access to intensive care and improve the quality and cost-effectiveness of care at local hospitals and tertiary centers, do we have any encouraging words for potential parents? We can tell them about some encouraging numbers. We can cite an English study by Ann L. Stewart, M.B., Ch.B., and E.O.R. Reynolds, M.D., [*Pediatrics* 54:724, 1974]. In a series of 197 babies weighing 1,500 gm or less at birth, there were 98 long-term survivors. At follow-up, 86 out of 95 children (90.5%) had no handicaps, four had physical handicaps, and five had mental handicaps.

A more recent study, by Sophia Franco, M.D., and Billy F. Andrews, M.D., [*Pediatr Clin North Am* 24:639, 1977] reports that the incidence of cerebral palsy in premature infants weighing less than 2,500 gm at birth was less than 1%. Also, a personal communication from Edmund A. Egan II, M.D., at the University of Florida in Gainsville, reported that in a series of infants weighing less that 1,500 gm at birth, follow-up at six months to two years revealed 91% were normal.

To consolidate the gains already made, we must concentrate on prevention during the intrapartum period; we must lower the threshold for cesarean section; we must improve perinatal nutrition and the nursing care of infants with respiratory distress syndrome. Meeting these priorities will do much to prevent perinatal conditions unfavorable to any newborn and especially threatening to the small infant.

Society ***has*** the ability to save small babies and give the majority of them the opportunity for normal life. For social, economic, and, most important, for humanistic reasons, these babies deserve that chance.

This editorial was originally published in *Contemporary Ob/Gyn*, Volume 10, October 1977 on pages 110 and 111. It is reprinted here by permission of *Contemporary Ob/Gyn*, 5 Paragon Drive, Montvale, New Jersey 07645-1742. Phone 201-358-7200. To subscribe call 1-800-432-4570.

IMPROVING OUTCOMES IN ELBW INFANTS

by Martha D. Mullett, MD, MPH

Outcomes for Extremely Low BirthWeight (ELBW, <1000 gm) infants have improved dramatically during the previous decade. The lowest birthweight expected to survive has decreased as have associated complications. Twelve years ago there was little hope for infants born at 26 to 27 completed weeks gestational age, but today they are expected to do well. Unfortunately we still lose most of those born before 25 weeks.

New therapies include the following:

Improved tocolytics
Enhancement of fetal lung maturity via maternal corticosteroids
Group B Streptococcus (GBS) antibiotic prophyllaxis
Early and rapid maternal/fetal transfer to Level III perinatal centers
Reduction in IntraVentricular Hemorrhages (IVHs) via neonatal indomethacin
Enhancement of fetal lung maturity via neonatal surfactant.

The first three represent advances in obstetrics, the fourth a major advance in both obstetrics and pediatrics, and the last two advances in pediatrics.

Though currently unavailable, effective and predictable tocolytics would solve many of the worst clinical problems facing both obstetricians and neonatologists. Even a brief delay in delivery allows institution of maternal corticosteroids, Group B Strep (GBS) prophyllaxis and maternal/fetal transfer. One of the more important advances has been in treatment of Respiratory Distress Syndrome (RDS). We always begin surfactant administration as soon as RDS is diagnosed (rescue therapy), but instillation of intratracheal surfactant is begun prophylacticly in the delivery suite immediately after intubation for those newborns under 26 weeks gestation. This decreases the incidence and severity of RDS and improves survival while also providing other benefits.

In 1980 our Neonatal Intensive Care Unit (NICU) became involved in clinical trials using surfactant prophyllaxis in <1100 gm birthweight babies and our incidence of IVH plummeted in both the control group (intubated without surfactant) and the study group (intubated with surfactant). We now intubate all ELBW infants in the delivery suite at delivery and those weighing less than 750 gm get surfactant immediately. Intubation probably smooths the transition from life in utero to the outside world by decreasing hypercarbia and acidosis.

Today almost all our serious IntraVentricular Hemorrhages (IVH) are in outborn ELBW infants (Fig. 1). Such results require constant in-house availability of physicians and nurses well-qualified in resuscitation of ELBW infants. Use of this protocol by those less experienced would probably be of less benefit.

Another new treatment is prophylactic indomethacin immediately following delivery for premature infants ≤26 completed weeks gestation. Data from other perinatal centers' studies show a small decrease in incidence of IVHs and suggest a corresponding decrease in pulmonary hemorrhages. Indomethacin has traditionally been used to treat symptomatic persistent Patent Ductus Arteriosus (PDA) after the first three days of life. PDA is thought to increase the risk of pulmonary hemorrhage after surfactant therapy in infants under 750 gm, but indomethacin apparently prevents such hemorrhage and delays the symptomatic PDA if it recurs.

Extremely premature infants are already immunocompromised, and with more and more being cared for in our NICUs we are seeing more and more newborn sepsis. Most of these cases are due to coagulase negative staphylococcus, slightly delaying discharge from the hospital but not increasing mortality. This better survival of ELBW infants also increases the incidence of BronchoPulmonary Dysplasia (BPD) due to pulmonary immaturity, so we are seeing more ventilator-dependent infants with increased ambient oxygen requirements after extubation. The good news is these BPDs tend to improve with time without further treatment.

Percentage Intraventricular Hemorrhage in Low Birthweight Deliveries at West Virginia University Children's Hospital, 1986-1998

Figure 1

Extremely Low Birthweight Deliveries and Survivals at West Virginia University Children's Hospital, 1986-1998

υ = Total Admissions <1000 gm σ = % Deaths — = Linear Total Admissions <1000 gm

Figure 2

Both morbidity and mortality has improved for ELBW infants. The decreased incidence of IVH has lowered severe spasticity and intraventricular shunts in these babies. Since 1986 the number of ELBW infants treated at West Virginia University Children's Hospital has increased 30%, probably due to a lowering of the viability threshold as perceived by obstetricians and pediatricians alike (Fig. 2). Average length of stay has decreased fifteen days for survivors but unfortunately has increased five days for non-survivors.

The most important improvements in my opinion have been administration of antepartum maternal corticosteroids, increased utilization of better maternal/fetal transfer systems and intubation in the delivery suite with prophylactic surfactant for the smallest newborns. The method of delivery doesn't seem as important as the capabilities and experience of personnel and facilities in easing the ELBW infant's transition from a protected intrauterine environment to extrauterine ventilator support.

The future of ELBW research probably lies in randomized trials to evaluate the benefit of mothers at 22-24 weeks gestation in premature labor receiving antibiotic treatment for coexisting bacterial vaginosis. Preliminary data suggest an increase in the length of gestation for those so treated. Basic research has found evidence that the cytokines released by Gardnerella vaginalis may worsen BPD, therefore antibiotic treatment should be of benefit. We neonatologists also need further research into essential nutrients required by ELBW newborns in order to inhance their growth with improved hyperalimentation regimens. Considering all the above, the future for ELBW infants looks fairly good and should improve even more.

PRIMUM NON NOCERE

by Nancy C. Chescheir, MD, FACOG

Eight to ten percent of all births in the United States occur prior to 37 completed weeks gestation, the primary cause of the majority of our perinatal deaths. Their prevention and with it their ensuing morbidity, mortality and suffering have always challenged obstetricians and we still have no proven tools in our bag to ensure a term gestation. Efforts to find a safe, inexpensive, effective, perfect tocolytic have been fruitless. We prescribe oral tocolytics for many women but with little support from evidence-based medicine.

Tocolytic therapy is used for two major indications, treatment and prevention of acute premature labor and chronic threatened premature labor . It is usually administered in the labor and delivery suite and frequently involves parenteral therapy with magnesium sulfate, a beta-2 agonist such as ritodrine or terbutaline, or a prostaglandin synthetase inhibitor such as indomethacin. In 30% of women diagnosed with premature labor uterine contractions stop with no therapy and in many others with tocolytic treatment. Parenteral acute tocolysis has been shown to reliably extend gestation by 24 to 48 hours in selected patients. Once the acute event has passed we frequently prescribe oral terbutaline as maintenance therapy. In a study of 239 pregnant women who presented to community hospitals at a mean gestational age of approximately 32 weeks with premature contractions either with or without cervical changes, Hueston found that 73% received tocolytics while hospitalized.[1] Fifty-five percent of all admissions were discharged on tocolytics.

Does oral terbutaline prolong pregnancy plus improve maternal and fetal outcomes? One would certainly think so given its high rate of use but several investigators have examined this question and their data show no such benefit. Rust reported a trial of women with documented premature labor to include cervical change who were then randomly assigned to receive either oral terbutaline, oral magnesium sulfate or placebo in an effort to prevent recurrent premature labor and subsequent premature birth.[2] All patients received a comprehensive program of preterm birth prevention including weekly visits, home uterine contraction assessment and preterm labor education. The investigators found that tocolytics provided neither demonstrable benefit nor detriment to maternal or neonatal outcomes although patients receiving oral terbutaline had a higher rate of side effects. This study supported pooled previous data that oral beta-mimetic drugs offered no better benefit in prolonging pregnancy than placebo.

Lewis and Mercer also randomly assigned women in acute premature labor who had been successfully tocolyzed to either oral terbutaline or placebo maintenance[3]. They demonstrated no significant change in the delivery rate after one-week, latency period, estimated gestational age at delivery or the percentage of women experiencing recurrent premature labor. Post hoc analysis suggested a possible prolongation of pregnancy in treated women enrolled at less than 32 weeks but the authors felt this needed further evaluation. How and Hughes also studied women randomly assigned to oral terbutaline or placebo maintenance and found no difference in gestational age at delivery, percentage delivered at greater than or 37 weeks, number of readmissions, number of unscheduled hospital visits or neonatal outcomes in either group independent of stratification by Bishop score at randomization.[4]

Higby et al reviewed over 300 articles on tocolytics, concluding:

> "There are no verifiable benefits to mother or fetus from long-term therapy with beta-sympathomimetics to arrest preterm labor. Chronic exposure may adversely affect the fetus. Maternal side effects are inevitable and can be life-threatening".

What adverse fetal effects? The fetus is exposed to the same beta-mimetic effects as its mother. Fetal complications can include increased thickness of the intraventricular septum, myocardial ischemia and neonatal hyperinsulinemia as well as the pharmacological effects on fetal heart rate, increased cardiac output and redistribution of blood flow. Chronic exposure to beta-mimetic drugs may also produce maternal side effects such as pulmonary edema, myocardial ischemia and hyperglycemia, thereby decreasing their safety and usefulness.

Higby noted that beta-mimetic drugs administered to treat acute premature labor may stop uterine contractions for 24 to 48 hours and recommended their use in this setting. This same prolongation of pregnancy in acute preterm labor has also been shown by others. Certainly a 24 to 48 hour delay of labor allows administration of corticosteroids to promote neonatal pulmonary maturity. Corticosteroids have been of proven benefit to the premature neonate in avoiding or ameliorating respiratory distress syndrome, permanent lung injury and intraventricular hemorrhage without demonstrable side effects when given as a single course to women at risk of delivery prior to 34 weeks gestation with intact membranes. There is still some controversy over its use in preterm premature rupture of the membranes. Unfortunately steroids are not used as frequently as they should be. Hueston's previously noted study found only 8% of eligible patients received steroids despite their 55% maintenance rate on tocolytic therapy.

Most non-anecdotal reports in the literature indicate no significant beneficial effect by terbutaline toward significant prolongation of pregnancy in women at high risk for both maternal and fetal side effects, so why do some of us continue to frequently prescribe oral terbutaline for acute tocolysis and maintenance? And why the hesitancy to prescribe steroids which have been of proven benefit? What are our goals here? We all have an anecdote or two about patients who were treated until 35 or 36 weeks gestation, tocolytics were

stopped and they delivered the next day. The very legitimate desire to avoid premature delivery is a powerful motivation to at least do *something*. In this case it is more important to first do no harm.

Maintenance oral terbutaline may have a role in selected patients but only after considerable informed consent discussion about known risks and possible benefits. There is no data to support its use routinely after successful inpatient therapy for premature labor. Instead it should be reserved for healthy women remote from term thought to be at extraordinarily high risk of premature delivery, and then only under close maternal and fetal observation. Corticosteroids should not be initially withheld when the obstetrician is concerned enough to attempt tocolysis. Neither has oral therapy with other classes of tocolytic drugs been shown to be of maternal or fetal benefit. It is hoped that continuing basic and applied clinical research into premature labor will improve our therapies, but for the moment we must accept our limitations and avoid potentially harmful therapies which offer little benefit.

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PRETERM LABOR IN MULTIPLE GESTATIONS

by Michael O. Gardner, MD, MPH, FACOG

Preterm birth has been the primary cause of neonatal mortality and morbidity in the United States for many years and remains so even today despite considerable progress in medical technology and therapy. A substantial rise in the preterm birth rate has mostly been due to an increasing number and proportion of multiple gestations over the past 30 years, more especially the last ten. This article is intended to address the epidemiology of preterm birth in multiple gestations, new developments in predicting their preterm birth, and more recent recommendations on their treatments such as tocolytics and corticosteroids.

Prematurity remains the most vexing of all the many complications associated with multiple gestations. Most twin pregnancies will deliver prior to 36 weeks, triplets prior to 33 weeks, and higher order gestations even earlier. One delusive myth over the years has been that preterm newborns from multiple gestations have better outcomes than corresponding singletons. Multiple studies have belied this by confirming that when controlled for gestational age and birthweight, complication rates for both are the same. Prematurity therefore accounts for most multiple gestations' excessive morbidity and mortality.

In 1973 the odds of a twin gestation occuring was one in 55 singleton deliveries; by 1990 it was one in 42. This increase has been predominately due to our society's delayed childbearing and the phenomenal technological advances in assisted fertility. Today there are more twins born to mothers over age 35 than ever before and twice as many women deliver over age 30 as in 1970. The primary factor responsible for both has been assisted fertility since older women have higher rates of infertility.

Today assisted reproductive technology is relatively common due to its improved efficacy and increased availability, plus the reported infertility rate in the US is rising. Clomiphene citrate is associated with an 8% twinning rate while other ovulation induction agents' rates for all multiple gestations are even higher, producing what has been described as an explosion of higher order gestations as evidenced in the popular media. The US rate of triplet gestation has actually more than doubled since the early 1980s. Twenty-seven percent of all the French National InVitro Fertilization Registry's successful IVF pregnancies were multiple gestations.

We should consider the etiology of preterm birth in light of this ever-increasing rate of multiple gestations and subsequent preterm births. There are three main categories of preterm delivery:

- Spontaneous preterm labor with contractions and cervical effacement leading to dilation and delivery
- Preterm (before 37 weeks gestation) Premature (before the onset of contractions) Rupture Of the Membranes (PPROM)
- Intended therapeutic preterm delivery justified by maternal or fetal complications such as severe preeclampsia or intrauterine fetal growth retardation.

Spontaneous preterm labor with contractions is a more common cause of preterm delivery in twins than singletons. The March of Dimes Prematurity Study found the following:

- Fifty-four percent of all preterm twin births are due to spontaneous preterm labor compared to only 44% of preterm singletons
- Preterm twins tend to be born earlier than preterm singletons, on average 33 weeks for the former and 35 for the latter.

Several possible causes of these differences have been theorized such as sub-clinical chorioamnionitis and/or overdistension of the uterus precipitating uterine contractions with subsequent labor and delivery.

Recent research suggests that sub-clinical chorioamnionitis is associated with both PPROM and preterm labor. About ten years ago Rouse et al failed to find an association between fundal height and preterm labor in twins. It remains unclear whether sub-clinical chorioamnionitis is more common in multiple gestations than in singletons.

Given the relatively high rate of preterm birth in multiple gestations, its prediction could be useful in its prevention. The NIH Preterm Prediction Study looked at different markers for preterm delivery in twin gestations. The most reliable predictor of preterm birth in twins was cervical length less than 25 mm on transvaginal ultrasound. A positive fetofibronectin at 24 weeks, the best predictor in singleton pregnancies, was less reliable. Maternal race was not a good predictor of preterm birth in twin pregnancies even though African-American women have double White women's rate of preterm singleton births. In multiple gestations there is no difference. This suggests the mechanisms of preterm delivery in multiple gestations may override whatever factors account for the racial disparity in preterm birth in singletons.

According to the March of Dimes study preterm delivery is due to PPROM in approximately 31% of preterm singletons but only 22% of preterm twins. In approximately 12% of all twin pregnancies preterm delivery is due to PPROM.

The higher rate of preterm delivery in all twins is responsible for their greater mortality compared to singletons. Twins account for only 2.6% of all births but 15.4% of all neonatal deaths and 12.2% of all perinatal deaths! Their morbidity rate is also much higher than singletons. Severe IntraVentricular Hemorrhage (IVH) occurs in 7.9% of all twins and Respiratory Distress Syndrome (RDS) in 13.8%, yet when one compares preterm singletons and preterm twins there is no difference in their rates of IVH, RDS or neonatal sepsis.

Much research has focused on prematurity prevention and identification of risk factors such as a previous preterm delivery and multiple gestation. More recently other risk factors have been reported such as the previously noted decreased cervical length and presence of cervical fetofibronectin, but unfortunately no reliably successful interventions have been found.

In the 1970s weekly cervical assessments were advocated to identify women at risk for preterm delivery but comparison studies failed to demonstrate any improvement in outcomes. Other methods studied included prophylactic oral tocolytics but again there was no significant reduction in preterm delivery rates. In a randomized trial by Weeks et al preterm birthweights were the same in women who received prophylactic cervical cerclage and those who did not.

Hospitalization with bedrest for twin gestations has been abandoned. A review by Andrews et al from Parkland Memorial Hospital showed no benefit in prevention of preterm delivery between in-hospital bedrest and decreased activity at home. Two studies from Scandinavia suggested multiple gestation outcomes were even worse after hospitalization for bedrest compared to decreased activity at home.

Many people over the years have advocated Home Uterine Activity Monitoring (HUAM) in selected multiple gestations. The CHUMS trial enrolled over 190 multiple gestations with no difference in neonatal outcomes between HUAM and weekly phone calls from a clinic nurse. Dwyer et al's clinical trial published by *The New England Journal of Medicine* in 1999 also showed HUAM to be without benefit.

Even the previously mentioned new technologies of cervical ultrasound mensuration and fetofibronectin assay have been disappointing as screening tools for preterm births. They accurately identify women at risk for preterm delivery but there is still no effective intervention for those who screen positive.

Tocolytic medications have been used to treat threatened and established premature labor in multiple gestations for the last thirty years. Ritodrine, effective in delaying delivery for 48 hours, is unfortunately associated with maternal pulmonary edema in twin gestations. Moreover there has been some retrospective data suggesting there are increased rates of severe IVH in neonates exposed to ritodrine. Tocolytics are effective in preventing preterm delivery for about two days but may allow time for safe transport to a Level III perinatal center and administration of antenatal corticosteroids. Magnesium sulfate is the most commonly used tocolytic in the United States but its efficacy over placebo has never been proven.

Indomethacin has been shown to reliably delay preterm delivery for up to seven days but neonatal toxicity concerns remain unanswered. Several retrospective studies have suggested increased rates of severe IVH and necrotizing enterocolitis. It probably should not be administered after 32 weeks due to increased incidence of premature closure of the fetal ductus anteriosus.

The two outstanding obstetrical interventions shown to improve neonatal outcomes in those infants destined to be born preterm are delivery at a Level III perinatal center and prophylactic antenatal maternal administration of corticosteroids. Corticosteroid prophylaxis of multiple gestations at risk for preterm delivery has been shown to reduce their rate of RDS by 40% and, more importantly, severe IVH by 50% and neonatal mortality by even 60%. Currently the same dosing regimen recommended for singleton pregnancies is used in multiple gestations. Continuing research comparing repeated weekly courses of treatment to single course therapy should maximize the benefits of corticosteroid prophylaxis.

In summary, multifetal gestations remain a challenge to the expectant mother and her obstetrician. Preterm delivery remains the greatest threat to the survival and health of these infants and further research is needed to develop effective preventive treatments. Maximizing preterm infant survival with minimal permanent disability by initiation of antenatal maternal corticosteroids followed by timely maternal-fetal transport to a Level III perinatal center for delivery is nonetheless imperative.

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From *The West Virginia Board of Medicine Newsletter*, Volume 4, Issue 1, JANUARY 2000 - MARCH 2000, published by the West Virginia Board of Medicine, 101 Dee Drive, Charleston, West Virginia 25311. Phone: (304) 558-2921. Fax: (304) 558-2084. Website: www.wvdhhr.org/wvbom.