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## A Primer of Obstetrical Problems

A few months ago your editors were heartened to hear that a *Bulletin* of some five years ago is still kept, much thumbed, on the shelves of several of our members. This was the last Grace Hospital issue, which made pretence of being a handbook of current thought on many problems of the management of pregnancy and labour. It seems that it often came to the rescue of a worried obstetrician in the wee small hours of a difficult delivery, much as *Pye's Surgical Handicraft* has been the prop and stay of so many young graduates in the Emergency Department.

We believe that the time has come to bring this handbook up to date, and have commissioned a team of the leaders of Obstetrical thought in the

Province to rewrite those papers that are of current value, and to write new ones where needed. The present issue of the *Bulletin* is the result.

This is in line with our attempts over recent years to provide for the members of the Society a Postgraduate course in medicine as a part of the advantages of membership. It is our hope that readers will comment on this policy, and that they will tell us just what subjects they would most like to see covered in future months. Both inside and out of Dalhousie University there is a body of teachers who will be glad to help.

Our achievement this month will be measured by the copies in use by doctors five years from now.

J.F.F.

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This issue has been contributed by  
the Medical Staff of the  
Grace Maternity Hospital  
Halifax

Coordinating Editor; Dr. M. G. Tompkins, Jr.

The authors will be glad to provide advice and assistance  
on any point of doubt.

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# Prevention of Maternal Mortality Due to Hemorrhage<sup>1</sup>

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Between June 1, 1958 and December 31, 1964, the Committee on Maternal Welfare of The Medical Society of Nova Scotia reviewed a total of 56 maternal deaths. Six of these were "non-related obstetrical deaths" and unrelated to the pregnancy, occurring from accidents and non-related infections. Of the 50 maternal mortalities that occurred during this period, 47 deaths or 94% were considered to have "avoidable factors."

Avoidability was judged in an ideal academic sense as defined in the Guide for Maternal Death Studies of the American Medical Association. This concept involved three assumptions. First, the attending physician possessed all the knowledge currently available relating to the factors involved in the death. Secondly, he had a high level of technical ability. Thirdly he had all the facilities present in a well organized and properly equipped hospital available to him. Because of the austerity of these criteria it is desirable to determine "avoidable factors" involved in the deaths, rather than to label the death as preventable. This allows more specific discussion resulting in better maternal care. Responsibility factors are thus assigned as professional, hospital, patient or combined.

The largest single cause of maternal mortality in the Nova Scotia Study was hemorrhage and was responsible for 27 deaths or 54% of the maternal mortality. All of these deaths were considered to have "avoidable factors". One half of these women died as a result of rupture of the uterus. An analysis of these hemorrhagic maternal deaths prompts one to stress the following:

(1) Anaemia should be diagnosed and treated prior to delivery. The hemoglobin determination should be done when the pregnant patient is first seen and it should be repeated at least once, preferably at 36 weeks of gestation. Routine prenatal oral iron supplement should be given and if megaloblastic anemia develops folic acid 5 mg. three times daily should be given as well. If a secondary anemia is not diagnosed until late in pregnancy, intramuscular or intravenous iron should be given according to the manufacturers' recommendations. In severe anemia blood transfusions may be indicated.

(2) Patients with vaginal bleeding in the last trimester of pregnancy should only be examined vaginally under a "double setup" with adequate cross matched blood, anaesthetist, surgical assistants and instruments present for an immediate Cesarean section if required.

(3) All hospitals entrusted with obstetrical care should have a prearranged method for rapid procurement and administration of massive blood transfusions. This deficiency was the most common single avoidable factor in the hemorrhagic deaths.

(4) Oxytocin (Pitocin or Syntocin) should only be used to induce or enhance labour in women who have had four pregnancies or less. It should not be used in women who have had previous Cesarean section, myomectomy, or cervical lacerations or where disproportion is present. It should only be used in a dilute intravenous drip; beginning with 2 to 5 minims in 500 mL of 5% glucose in water at a rate of 15 drops per minute. This rate is to be varied depending on the uterine response and should be under the constant supervision of the attending physician.

(5) More than half of all ruptured uteri result from dehiscence of a previous classical caesarean section scar. They usually occur *prior to labour* and at from 30 to 34 weeks of gestation.

(6) A ruptured uterus demands an immediate laparotomy. Resuscitative measures including arrangements for the administration of massive rapid blood transfusions are indicated. The pelvic anatomy is often markedly distorted due to retroperitoneal hemorrhage following rupture of a puerperal uterus where the cervix has been involved. Total hysterectomy is often not sufficient to control the bleeding and ligation of both internal iliac vessels may be necessary. During laparotomy manual compression of the aorta at the pelvic brim is helpful in controlling the hemorrhage. It should be stressed that the surgery that is necessary in such an instance may be very difficult technically and the best surgical assistance available should be obtained.

<sup>1</sup>From the Committee on Maternal & Perinatal Health of The Medical Society of Nova Scotia.

(7) When a catastrophe such as a ruptured uterus occurs the attending physician should request assistance from as many of his colleagues as necessary. If adequate assistance is not available in the community immediate assistance should be requested from another area.

(8) There is no place for the Crede manoeuvre in modern obstetrics. If the placenta is not expelled after delivery of the infant and if hemorrhage is profuse, the placenta should be removed manually.

(9) If postpartum hemorrhage occurs there should be complete examination of the birth canal including the vagina, the cervix and manual exploration of the uterine cavity to exclude a rupture of the uterus. As the majority of primary ruptures of the uterus occur in the lateral aspects of the uterus, the right side of the uterus should be examined with the right hand and the left side of the uterus with the left hand.

(10) In **postpartum** uterine atony, 20 units or more of oxytocin in 500 mL of 5% glucose in water should be given as an intravenous drip for four or more hours. This intravenous drip may be repeated as necessary to control the atony. Large doses of oxytocin are antidiuretic and may lead to pulmonary edema. This can be avoided by not overhydrating the patient. This antidiuretic effect disappears after the oxytocin has been metabolised. This treatment for postpartum uterine atony should not be used until the complete birth canal has been examined to exclude lacerations or, retained placental fragments, and afibri-

nogenanemia has been excluded by clot observation.

(11) There is no place in present day obstetrics for internal podalic version because of its association with rupture of the uterus.

(12) When treating severe postpartum hemorrhage the patient needs massive blood replacement. Overhydration with other fluids has resulted in pulmonary edema and death.

#### **Emergency Obstetrical Team**

With antepartum, intrapartum and postpartum hemorrhage *adequate consultation is mandatory*. If this is not available in the area when an obstetrical catastrophe occurs, the Emergency Obstetrical Team is available through the Case Room of the Grace Maternity Hospital in Halifax Phone 422-6501 and requesting their assistance. This service will do its utmost to help in the situation. This is a sincere endeavour by The Medical Society of Nova Scotia and the Department of Health of the Province of Nova Scotia to help to decrease the provincial maternal mortality. This service cannot help unless requests are made and it should be remembered that when a true obstetrical hemorrhagic catastrophe occurs the attending physician cannot afford to procrastinate but must immediately put into action a prearranged method of rapid massive blood procurement and administration, examine the complete birth canal for the cause of the hemorrhage, to treat the cause; and obtain immediate adequate assistance. □

### **GENERAL PRACTICE OPENING**

Energetic young physician wanted to associate with me in expanding urban Nova Scotia general practice, by summer of 1966. This position is NOT a salaried assistantship and has the advantages of a newly equipped office and regular sign-off arrangement. Apply to Box No. 101, The Nova Scotia Medical Bulletin.



# Forceps -- When and Why?

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Halifax, N. S.

The obstetric forceps, when properly used, is an instrument designed to extract the infant from the birth canal, or to rotate its head within the vagina. A forceps delivery should help to reduce mortality and should not damage important maternal structures.

Those interested in a description of the various designs of forceps, the types of locking devices in different designs (English, French, German) are referred to any standard text book: some of the more recent designs, such as the Malmstrom Vacuum Extractor and Shute's Parallel Forceps, may not be described except in recent publications. The Simpson forceps is the one most commonly used and will be the type used in this article.

## Purpose

Traction to the head to extract it from the birth canal is the prime purpose of the forceps. When the head lies in the transverse or posterior position, forceps may be necessary to rotate it to a more favourable position for delivery. Forceps should never be used as an instrument of compression, though some degree of it may be inevitable, nor should it be used as an instrument to dilate the cervix.

## Rule of the Forceps

The left blade is so named because it is held in the left hand when introduced and passes to the left side of the mother. Therefore the rule is - "left blade, left hand, to left side of pelvis. Right blade, right hand, to right side of pelvis." To facilitate locking, the left blade is introduced first.

The forceps is designed to fit the sides of the head and the sides of the pelvis at the same time. By remembering this, the instrument is least likely to cause harm.

Exact diagnosis of position must precede every forceps application.

## Law of the Forceps

The front of the forceps must look in the direction of the point of direction of the head, viz., occiput, chin, etc.

Forceps operations should be performed on

an operating or delivery table, or on a kitchen table properly prepared, or at least in the cross-bed position. Never attempt to do a forceps delivery with the patient lengthwise on the bed, unless turned on her side. (Sims' position).

A very useful and helpful hint is for the operator to take the blades of the forceps and lock them in front of the patient in the exact manner in which they will lie upon the child's head in the pelvis.

## Indications

The use of forceps is indicated when the termination of labour becomes necessary or desirable, and when a forceps extraction is the safest method for delivery of the baby. With the exception of prophylactic low forceps, instrumental delivery should be avoided unless a definite indication obtains for its use.

Probably the most frequent indication for forceps delivery is lack of progress in labour. This may result from uterine inertia, malposition of the presenting part, or some obstruction to its descent. Generally speaking forceps delivery is considered when there is no progress in descent or rotation of the head (in the presence of adequate labour) within two hours of complete dilatation of the cervix in a primipara, and somewhat less time in a multipara. Forceps extraction should be carried out promptly if spontaneous delivery has not occurred within an hour after the head has reached the pelvic floor, and showing at the vulvar orifice.

Elimination of the expulsive phase of labour by forceps delivery is desirable in women with heart disease, hypertension, and debilitating diseases such as tuberculosis.

Fetal distress, indicated by irregularities of rates above 160 or under 100, in the second stage may necessitate prompt delivery to prevent death of the fetus. Before delivery is carried out in the interest of the fetus alone, one must be certain that prompt extraction is necessary and can be carried through safely. Where meconium only is noted in the amniotic fluid in a cephalic presentation, do not panic or rush into a rapid delivery. Extra vigilance is indicated in checking the fetal heart.



Prolapse of the cord may necessitate a quick extraction, providing conditions are suitable (cervix more or less completely dilated or dilatable), the head in the pelvis, and the baby alive.

Delivery by outlet forceps with episiotomy as advised by DeLee as a means of shortening the perineal phase of labour and thereby reducing injury to the pelvic floor and the fetal head which distends it, has a definite place in the list of indications, but preferably is carried out by experienced attendants.

### Conditions for Forceps Delivery

*The cervix must be fully dilated.* Serious injury to the mother and/or child may result from attempted delivery through an incompletely dilated cervix. Manual dilatation should be avoided for similar reasons. Sufficient dilatation for delivery can usually be obtained by incisions in the cervix (Dührssen's incisions) at two and ten o'clock, in cases where delivery becomes necessary late in the first stage of labour when the cervix is the chief cause for the delay. There are times when the multiparous cervix, less than completely dilated but dilatable, can be easily pushed over the head with the contractions and then forceps applied safely.

*The head must be engaged.* This means the head must be at the level of the spines or preferably lower before any attempt at delivery is made with forceps. It is far safer to wait a little longer, encouraging the patient to cooperate with contractions, providing the baby is not suffering any ill-effects.

*No marked disproportion should be present.* Where there are minor degrees of alteration in the size and shape of the pelvis, or abnormal positions of the head, forceps delivery may well be indicated.

*The presenting part must present in position to permit delivery and large enough to be held within the forceps blade.* Breech and chin posterior positions are not suitable for forceps delivery, regardless of size.

*The bladder should be emptied at delivery. The membranes must be ruptured.* Prior to application the operator should attempt to duplicate, outside the pelvis, the movements made by the head and the forceps blades, as they pass through the pelvis. This is particularly apropos where rotation of the head is necessary.

*Anaesthesia* is necessary for forceps delivery, the type depending upon the ease with which it can be effected. For simple low forceps, pudendal block with local anaesthesia will usually suffice, but in some hypersensitive individuals, 50-75 mg of Demerol given intravenously at the time of the pudendal block will often overcome many difficulties. Where forceps rotation is necessary, or considerable traction is expected, inhalation or

saddle-block anaesthesia administered by a physician should be chosen.

For pudendal block, the flexible plastic sleeve-catheter-needle device of Abbott's is extremely useful and is recommended for this purpose.

### Application of Forceps

Forceps applications are classified according to the depth the head has descended into the pelvis at the time the blades are applied.

Low-forceps is the application of the blades when the head is on the perineum, or visible through the introitus.

Mid-forceps obtains when the head has become engaged (i.e. at the spines) but before it has reached the pelvic floor. Rotation is usually not complete. Some like to divide the operation into mid-forceps and low-mid-forceps, but I feel it is splitting hairs and probably is an effort to relieve one's conscience, which should not be necessary.

High-forceps is the application before engagement has taken place. It is only mentioned to be condemned.

The term "cephalic application" is when the blades have been placed over each side of the head in the occipito-mental or bi-parietal diameter, and equidistant from the sagittal suture.

The term "pelvic application" indicates that the blades are placed toward each side of the maternal pelvis, with the front of the forceps directed anteriorly, the pelvic curve corresponding to the pelvic axis curve without regard to the position of the fetal head in the pelvis. Such an application will often grasp an unfavourable diameter of the head, and injury may result. It is not recommended. With the introduction of the Malmstrom Vacuum Extractor much of the danger of damage to soft parts is obviated, especially to the mother, but there is some slight degree of danger to the baby, due to trauma by the suction cup, especially when fairly strong traction is necessary to effect delivery of the head. The instrument is popular in many centres in Europe, but it does not enjoy the same popularity in North America.

### Technique of Forceps Operation

One will do his best work by adopting an acceptable technique and using forceps to which he has become accustomed. The Simpson forceps, or one of its modifications, will suffice for practically all mid- or low-forceps extractions, as well as for the aftercoming head in breech delivery. Kielland forceps may be found more useful for rotation, because of its reduced pelvic curve angle, but is rather too light for difficult extractions.

It is very important in any forceps extraction to make sure there is no obstruction present to prevent delivery, and that the exact position of



the head in the pelvis is known. It is usually best to place the whole hand in the vagina for this purpose, and if either fontanelle cannot be identified, time should be taken to feel either ear, and the position thereby determined. This is mandatory.

An adequate episiotomy, preferably the medio-lateral type, is advisable in the primigravid patient, and in multiparas with a good perineum. Where the perineum has not been distended by the advancing head as in mid-forceps extractions, a mild degree of ironing out of the perineum may be justified, though a deep medio-lateral episiotomy will probably preserve the structures of the pelvic floor much better, and will provide more room.

### Low-Forceps Extraction

(Outlet forceps, prophylactic low forceps). Here the head is visible and usually rotated to the anteroposterior position. After the exact position has been determined, and episiotomy performed, the following steps are carried out. The left blade is held loosely in the left hand, like a male sound. Two fingers (preferably four) of the right hand are inserted into the left side of the vagina reaching as far as the thinned out edge of the cervix through which the head has passed. The palmar surface of the fingers now lie close against the fetal scalp, thereby protecting the vagina from injury, and directing the blade of the forceps.

In introducing the left blade, the handle is held somewhat obliquely over the right groin, the tip of the blade is directed into the hollow of the sacrum, the handle is swung downward and to the woman's left in a long arc, thereby permitting the concave cephalic curve to slide around the convex fetal skull, while the pelvic curve adapts itself to the contour of the birth canal. As soon as the vertex is passed, the instrument slips along like a sound. No pushing is required if the blade is held properly and guided correctly. As the handle descends the blade will drop by its own weight into position beside the head. The internal hand remains in the vagina until the blade is in close apposition with the fetal head, and the tip checked to be sure it has not caught the cervix or a fold of the vagina.

While an assistant supports the left handle, the right blade in the right hand is introduced into the right side of the vagina, and along the palmar surface of the left fingers or hand, as just described for the left blade, placing it above the left blade. The two halves are articulated and locked. After locking the blades, the fetal heart should be checked to determine whether the cord has been compressed by the tips of the blades. Difficulty in locking suggests an error in diagnosis, re the exact position

of the head. Re-checking and necessary adjustments should be made before traction is exerted. Such adjustment should be carried out by the hand in the vagina and not usually by manipulating the handles outside.

Having made certain that the forceps blades have been properly placed, trial traction is made to learn whether the blades slip, whether the head responds to traction, and whether any part of the mother is caught in the blades. Take the heart tones.

The operator should sit down when ready to proceed. When traction is made, it should correspond fairly closely to the normal mechanism of labour, that is, some delay between tractions. Remember always that the skull is compressed and after each traction the handles should be released (not too suddenly) to restore circulation to the fetal skull and brain. During traction, the fingers of both hands are placed along the superior surface of the shanks, and the thumbs underneath the handles. Holding one's thumb or a towel between the handles will help to prevent undue compression. During traction, the elbows of the operator should be kept in contact with his ribs, so that in case the instrument slips off or the head delivers suddenly, a severe laceration of the perineum may be avoided. With the elbows in the proper position, traction will of necessity be in the proper mechanical direction - downward as well as outward. When the occiput comes to lie beneath the symphysis pubis, the handles are elevated and extension takes place as in the normal mechanism of labour. When the head is well engaged in the vulvar orifice, it is better practice to remove the blades and deliver the head by the modified Ritgen manoeuvre, especially where the outlet is very snug. An additional diameter of half a centimeter or more is gained in this way. Unless prompt delivery is indicated in the interest of the baby, slow extraction by intermittent traction and relaxation is preferable to a single, long, forceful pull.

The blades are unlocked gently, the right blade being removed first. Keep the cephalic curve in close contact with the skull, being careful not to catch an ear in the fenestrum of the blade, which could injure the ear or even tear it off.

In cases where the head presents at the vulva, as an occiput-sacral or face-to-pubis presentation, extraction with forceps differs little from that described above. Here, traction is executed downward until the anterior fontanelle appears beneath the symphysis, following which the handles are slowly elevated to deliver the remainder of the head by flexion. Because of wider diameters coming through, a deep episiotomy is indicated early.



## Mid-Forceps Delivery

Here the application of the forceps and extraction are more difficult because the head is higher, and usually has not rotated anteriorly. Transverse arrest and occiputposterior positions will constitute the chief indications for mid-forceps delivery. These are usually made necessary by cephalo-pelvic disproportion in the mid and lower diameters of the pelvis. Decision to deliver by mid-forceps should only be made if the progress of labour has ceased, and if no safer termination is possible. A second stage of some two hours should be allowed, unless fetal or maternal distress indicates earlier interference.

One should keep in mind that a difficult mid-forceps operation carries a higher fetal mortality than Caesarian Section. Good anaesthesia, adequate assistance, and experience are prime requisites for a successful termination. For most mid-forceps extractions, conventional forceps combined with the Pajot manoeuvre (simultaneous downward pressure on the shanks of the forceps, upward pressure on the handles) can be successfully used without injury to mother or child.

When delivery is indicated with the head in an occiput transverse position, a serious attempt should be made to rotate the head manually to an anterior position before applying forceps. Manual rotation must be done with the whole hand in the vagina (preferably right hand for left positions and left hand for right positions), the fingers on the posterior parietal bone, and the thumb on the anterior parietal bone, dislodging the head upwards a little and, when sufficient rotation is accomplished, keeping the hand in the vagina until the appropriate forceps blade is guided into proper position, followed by its fellow to the opposite side.

Occasionally manual rotation is not possible, and the blades must be applied to the head as it lies, but accurate placement may be difficult because of moulding or pelvic contraction. If one applies the law of the forceps, one blade would be required to be applied under the symphysis and the other to the hollow of the sacrum, while the front of the forceps would look directly to the right or left. The pelvic curve makes this impossible and some adjustment becomes necessary. The forceps blades are therefore applied in the oblique diameter. This means that one blade passes into the hollow of the sacrum and comes to lie on the posterior parietal bone or the mastoid process, and the other lies upon the anterior malar bone. This is known as a pelvic application. In occiputo-left-transverse, the left blade is passed into the hollow of the sacrum and its cephalic curve applied against the left parietal bone. The right blade is next guided with extreme care, by the hand in the vagina, and made to wander over

the face of the child until the cephalic curve lies on the anterior malar bone (the right malar bone). Be careful of the eye. The wandering blade begins to wander when the tip of it touches the chin.

When the application has been carefully checked, the blades are locked. The operator must realize that so great a diameter is included in the blades that the handles will lie far apart and the blades will not hold firmly. Caution must be exercised to avoid injuring the child by pressure and the mother by laceration through rotation, or slipping of the instrument. Check the fetal heart.

When the application begins, downward traction should be combined with rotation, and when rotation is completed it becomes more or less a low forceps delivery.

With occiput right transverse positions, the operation is similar except the sequence of insertion of the blades is reversed.

Mention must be made of the Kielland forceps. It was designed specifically as a rotator, and to seize the head from side to side, i.e. the biparietal diameters, without regard to its position in the pelvis. It has very little pelvic curve ( $15^\circ$  as compared with  $35^\circ$  of Simpsons forceps), and the sliding lock permits deeper insertion of one of the blades and thereby better application in cases of asynclitic attitudes of the fetal head. The front of the forceps is recognized by the presence of two small, raised knobs near the hook on each blade, which must point toward the occiput and thereby serve to indicate the position of the blades in the birth canal. As originally described by Kielland, the anterior blade is inserted first and passed between the head and posterior surface of the pubis within the cervix, and with the cephalic curve directed upwards towards the symphysis. With the blade entirely within the uterine cavity, it is turned through  $180^\circ$ , permitting the cephalic curve to apply itself to the side of the head. The posterior blade is introduced as in a cephalic application. The head is turned to an anterior position by twisting the handles without making the sweep motion necessary with forceps having a pelvic curve.

After a prolonged labour, however, this procedure may be dangerous with risk of uterine rupture because of excessive thinning of the lower uterine segment. It may well be safer to wander the anterior blade over the face of the infant as previously described. The opposite blade is applied in the usual manner.

## Forceps in Posterior Positions

Probably the highest percentage of mid-forceps operations are due to the head becoming arrested in the posterior position in the mid and lower pelvis. Forceps delivery of an occiput



posterior may be accomplished either in the original position (face-to-pubis) or by rotation of the occiput anteriorly before extraction.

Here, even more than in transverse arrest, manual rotation to an anterior position will greatly increase the ease of forceps application and extraction. Because the mid-pelvis is usually narrowed in these cases, it may be necessary to dislodge the head upwards, and to turn it and the back to an anterior position by combining manual rotation of the head with external pressure on the anterior shoulder through the abdominal wall. Before removing the hand from the vagina, insert the first blade and apply it to the side of the head, thereby helping to prevent its return to its original posterior position.

Where difficulty in maintaining rotation of the head is encountered, I have found that a T-clamp (wide allis) placed on the scalp in the vicinity of the posterior fontanelle and held by an assistant while the forceps blades are applied, a very useful procedure in preventing the return to the posterior position, and from this procedure no trouble whatsoever has been caused from the standpoint of laceration or infection of the scalp. Another method used to maintain rotation in these cases is to insert the entire hand into the vagina, past the presenting part and along the occiput until the posterior shoulder is reached with the fingertips and the occiput lying in the palm of the hand. With pronation of the hand, the shoulder can be carried over the promontory to the opposite side of the pelvis. The occiput will now be more likely to maintain its anterior position. One must be careful not to push the head up too far in this manoeuvre.

### Forceps Rotation

Instrumental rotation should be performed if manual correction is not possible, or if forceps extraction with the occiput posterior is too traumatic or difficult. Several methods are used to accomplish this.

Bill's modification of the Scanzoni method has become fairly popular with many obstetricians, the fundamental feature being rotation without traction at the level of arrest of the head. The chief steps are (1) application of the blades as for an anterior position (proper cephalic application after locking). (2) Flexion of the head may be maintained by raising the handles toward the opposite groin of the patient. (3) The handles are swept through a wide circle during rotation which maintains the blades in more or less the same axis during rotation and the fetal head likewise rotates with them. (4) When rotation is complete, slight traction downward will fix the head in the anterior position. The blades are now upside down and have to be removed. (5) The blades are re-applied

in the anterior position and the head extracted. Careful manipulation will avoid lacerations almost entirely.

### The Melhado Manoeuvre

The whole hand is pushed into the hollow of the sacrum and the head is pushed up into the upper part of the pelvis, or even out of the pelvis, and grasped with the palm of the hand over the posterior ear. The head is rotated to the transverse, and the posterior blade is passed between the hand and posterior ear. The anterior blade is now rotated over the face, the blades are locked and the occiput is rotated to the anterior quadrant of the same side and brought down. This is really a high forceps operation, however, and should be reserved for the expert. It does have the advantage of requiring only one application of the forceps.

### The Key-in-Lock Manoeuvre

This method described by DeLee is probably safer than either method described above, but requires more patience. The chief steps are push-up, twist, pull, and repeat, accompanied by a wriggling motion of the head.

An attempt is made to apply the blades to the sides of the head. Failing this, they are laid in the transverse of the pelvis. The head is thus held diagonally as in a parieto-malar application previously described, an unfavourable position, and therefore held very delicately. Now the head is gently compressed and pushed up a centimeter or two in the birth canal and gently twisted, the small fontanelle being brought forward about 10° to 15° by sweeping the handles through an arc outside the pelvis. Repeat this manoeuvre several times, pushing the head up only as much as you pull down, and re-adjusting the blades with each degree of rotation accomplished. In this way one can usually coax the occiput to the front, whereupon the extraction may be completed without further trouble. One must not hurry nor turn too much at one time, not more than 10° to 15°.

### Forceps in Face Presentations

Forceps are not infrequently indicated in delivery of face presentations, especially in primigravidas. The blades are applied in the mento-occipital diameter, and traction downward exerted until the chin passes from under the symphysis, following which the handles are elevated and the head delivered over the perineum by flexion. A considerable amount of traction is sometimes necessary, especially if the head is large. Because chin-posterior position cannot be delivered as such, the chin must be rotated anteriorly before the forceps can be applied.



### High Forceps

Where the head has failed to enter the pelvic inlet, forceps application is contraindicated and will not be discussed.

### Forceps on the Aftercoming Head

This properly belongs under breech delivery and I feel need not be discussed here, except to say it should supercede forced manual extractions.

### Failed Forceps

There occurs the infrequent occasion when the forceps can be applied properly, but extraction found to be impossible. An unrecognized abnormal position of the head is the most frequent cause of failure with forceps, and correction of it may overcome the failure. A greater degree of disproportion between the head and the pelvis than was expected, or constriction rings may be the cause. When downward traction fails, even though considerable force is applied, another method of delivery should be considered, and Caesarian Section can be performed safely.

### Prognosis of the Forceps Operation

For the mother the dangers are injury, haemorrhage, and infection. Some laceration is inevitable. The higher up the forceps operation, the greater degree of laceration. Following delivery the cervix should be examined by pulling each lip down with a sponge forceps type of instrument, and any laceration over 1-1½ cm should be repaired. A continuous suture is satisfactory. The vagina must also be checked, especially for extension of the episiotomy either at its apex or

into the sphincter area. The side opposite the episiotomy should be checked and the area around the clitoris is frequently injured and the site of considerable bleeding. The bladder should be checked for injury, and if not certain, pass a catheter for evidence of blood in the urine or any perforation. Postpartum haemorrhage resulting from laceration or uterine atony should be corrected as soon as possible.

Dangers to the child are known and need not be detailed here.

### SUMMARY

Before applying forceps make sure that enough time has been given the patient to effect all the progress she is likely to make. Unless one's hand is forced by fetal distress or maternal exhaustion, allow at least two hours or more in the second stage before interfering.

Be very sure of the position of the head in the pelvis before applying forceps.

In applying forceps do not simply apply them pelvically, hoping all is well, and blindly pull with all your strength. Before application lock the forceps together and hold them before the patient in a position which they will occupy within the pelvis.

Learn to use one type of forceps and one forceps manoeuvre and stick by it.

Do not persist in unsuccessful attempts at forceps delivery that may well harm both mother and child.

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# When to Induce?

CARL TUPPER, M.D.

Halifax, N. S.

Induction of labour is considered good therapy when it is believed that the welfare of the mother or infant or both is best served by termination of the pregnancy. It would, therefore, seem obvious that there can be no definite rules for induction. Each patient is a case in itself and must be considered individually.

... If a patient begins labour spontaneously the labour is much better and the results more certain than when it is artificially induced. We say this because we know that, even under the best circumstances, situations will arise during induction that makes us all wish that we had left the pregnancy alone. Such complications as failure of the pregnancy to respond to all efforts of induction, infection, prolapsed cord, peculiar reactions to oxytocin and often being forced to do a caesarean section which otherwise would not have been required. These possible complications are acceptable *only* when we have a good indication for induction.

## What are these indications?

It would be foolish to be dogmatic about any of these. Each case, as noted above, must be considered on its own merits. Nevertheless the following may be used as a guide.

**A - Toxemia of pregnancy.** A mother with Toxemia in the last trimester, who fails to respond to therapy should probably have her pregnancy terminated. This is to prevent further progression of the toxemia and to avoid the constant threat of intrauterine death of the fetus. If conditions warrant, the method of interruption should be by induction of labour. Today this is one indication for induction that no one can criticize.

**B - The Rh sensitized mother.** It is well recognized that many babies are lost because the pregnancy has been allowed to progress too far and the baby becomes too involved. If we could interrupt this pregnancy at a time when the baby, although involved, was still in a condition that treatment could be given we would save most of the babies of the Rh sensitized mothers. We now have available many means to prognosticate the condition of the baby: - the antibody titre of the blood, the amniocentesis and often and extremely important the history of the mothers' previous

pregnancies. In spite of all these aids it is still extremely difficult to decide when best to induce your patient. In Winnipeg excellent results are achieved when all Rh problems are presented to a committee, who by their training and work become proficient in assessing the state of the baby and in determining when best to induce the patient. We, in Nova Scotia, have set up such a committee under the auspices of The Nova Scotia Medical Society. Any physician who has an Rh sensitized mother and is wondering how best to treat her, should present her history to the committee. I am sure that they will determine the best time of induction. We, in the Department of Obstetrics and Gynaecology, feel that this is so important that we ourselves are presenting our cases to this committee, asking their advice as to when they think it best to get this particular baby.

**C - Diabetes.** Most authorities agree that in spite of adequate care a certain portion of these babies will die in the uterus somewhere between the thirty-seventh and fortieth week of pregnancy and because of this they advise the interruption of pregnancy at the thirty-seventh week. The Baltimore group suggest that this be by induction of labour. The Chicago group advise caesarean section. All things being equal I would favour induction of labour and delivery by the vaginal route.

**D - Death of the fetus after viability but before term.** The occasional mother has difficulty in delivering a live baby. For some reason it does not survive the usual time of gestation and dies before term. This is probably due to some placental dysfunction. Should this occur on more than one occasion it is suggested that plans be made to interrupt the next pregnancy early by induction of labour, hoping to get the baby before it succumbs to whatever has caused the death of previous babies. More and more information is now being accumulated as to how one might suggest exactly what may be happening to the baby in the uterus. It is hoped that in the near future we will have available tests whereby we can measure some end products of the placenta such as estriol which would suggest to us that the placenta is beginning to fail and we should therefore



interrupt the pregnancy and get the baby. However, until such time as these tests are available we might want to interrupt certain pregnancies early because of a bad previous obstetrical history.

**E - Prolonged pregnancy.** There is no unanimity of opinions regarding this indication. European doctors assume that postmaturity results in placental insufficiency with serious consequences to the fetus and therefore recommend that any pregnancy that goes beyond 42 weeks be interrupted. On this continent there has been no real acceptance of this assumption. In our own department, in an investigation covering a period of twenty years, we have not been able to show that postmaturity *per se* does lead to an increase in neonatal mortality. Therefore, we do not think that postmaturity in itself is an indication for induction of labour.

**F - Elective induction of labour.** From an ethical point of view it would be very difficult to justify a bad result of induction that might potentially jeopardize the life of the mother or infant when the procedure was done solely for

convenience. When a doctor, therefore, induces a patient either for convenience of himself or the mother he must realize that should anything go wrong, as it certainly might, it will be very difficult for him to justify his act. Nevertheless we have all been faced with a mother who is at or over term and for some particular reason insists on having her baby early. Should one decide to undertake such an induction he must be certain that all conditions are ideal and that relative contraindications are absent. *It is best not to induce electively.*

The above, then, are what I would consider the true indications for induction of labour. Others undoubtedly will arise but must be considered on an individual basis. There are many risks associated with induction of labour. One must weigh these risks against the risk of leaving the pregnancy progress to spontaneous labour.

My humble advice, then, is if you have a good indication and know what you are doing - induce. If not, it is much better for you, the patient and the baby to leave her alone and let labour occur spontaneously. □

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## William Osler Medal

### STUDENT ESSAY CONTEST

The William Osler Medal of the American Association for the History of Medicine is awarded for the best unpublished essay on a medico-historical subject written by a student in one of the medical schools in the United States or Canada. All students who are candidates for the degree of Doctor of Medicine, or who graduated in 1965, are eligible. This medal, first awarded in 1942, commemorates the great physician, Sir William Osler, who stimulated an interest in the humanities among students and physicians alike.

Essays should demonstrate either original research or an unusual appreciation and understanding of a medico-historical problem. Maximum length is 10,000 words. The prize-winning essay will be submitted to the Editorial Committee of the Association, which may recommend it for publication in the *Bulletin of the History of Medicine*.

Essays must be submitted by March 23, 1966, to the Chairman of the Osler Medal Committee, William K. Beatty, Librarian and Professor of Medical Bibliography, Northwestern University Medical School, 303 East Chicago Avenue, Chicago, Illinois 60611.

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# The Management of Breech Presentations

M. M. DAVIS, M.D.

Halifax, N. S.

A Breech delivery occurs in about 3.5 percent of births. The risk to the full term breech infant is nearly three times that associated with vertex presentations and in the premature this risk is increased another three-fold. In addition to those infants who die as a direct result of trauma and intracranial damage sustained during delivery, there are those in whom brain damage may result in an abnormal child. Often subtle damage is not manifested at birth and does not make itself known until the child is older or when it begins school.

In view of the above, the handling of a breech delivery should be considered a major obstetrical procedure and the problems of management of grave concern to the attending staff of any hospital. In our two teaching hospitals a consultation is "highly recommended". I believe it should be mandatory.

The successful delivery of a living, normal infant by breech demands that cephalopelvic disproportion be ruled out as far as possible before or at the onset of labor. This means accurate clinical measurement supplemented by X-ray pelvimetry in all primipara, and in those multipara with a history of a difficult labor, small babies, or excessively large babies. Clinical estimation of the size of a baby is notoriously inaccurate but should be attempted. There is no such a thing as a "trial of labor" with a breech presentation as far as pelvic capacity is concerned. A contracted or borderline pelvis may allow descent of the compressible hip and shoulder girdles only to obstruct the passage of the aftercoming head at a time when the fetal circulation has become endangered by compression of the umbilical cord. A "trial of labor" is justified only for the assessment of the effectiveness of the uterine contractions. The decision as to whether this particular baby will come through this particular pelvis must be made before labor is allowed to proceed.

In a teaching hospital the Caesarian section rate for breech births will approach seven per cent as contrasted with an overall section rate of about 4 per cent. Here we have unlimited opportunities for specialist consultation, internes, residents, and expert anaesthesia. In hospitals without these facilities a rate approaching 15 per cent is probably

justifiable for breech births. Under such circumstances, the following would probably be considered as valid indications for Caesarian section with a breech presentation:

1. All primipara of 35 years or over.
2. Previous Caesarian Section.
3. All cases where there is a possibility of cephalopelvic disproportion. Here the opinion of a consultant is of unmeasurable value.
4. A multipara with a history of losing one or more infants during or following a previous difficult pelvic delivery.
5. A primipara or a multipara in whom the uterine contractions have been deemed incompetent by both the attending physician and the consultant.
6. The undisciplined, high-strung primipara with a so-called "low threshold for pain" who is difficult to manage in early labor.
7. Prolapse of the cord with a living baby.
8. When the breech remains high during the second stage of labor, as determined by vaginal examination.
9. Always in preference to breech extraction.

Allowing for the above situations which are best handled by Caesarian section there still remains 80-85 per cent of breeches which can safely be delivered from below. External version during the latter weeks of pregnancy is not a part of the recommended management and will carry a certain fetal mortality in the hands of the inexperienced.

Once delivery has been decided upon from below the following points are recommended in the management of this delivery:

1. Consultation be held with a fellow practitioner and arrangements made for assistance at the delivery.
2. Remember that about 30 per cent of breech births are premature so that sedation should be minimal - 50 to 75 milligrams of Demerol® alone or in combination with promethazine hydrochloride (Sparidol®) are usually sufficient. A minimal sedation program also permits the full co-operative efforts of the patient at all times. This is of the utmost importance during the actual delivery.



3. Once labor begins bed rest is usually advisable to minimize the danger of early rupture of the membranes. If this occurs the fetal heart should be checked immediately and if there is any change in the rate a vaginal examination performed to ensure that the cord has not prolapsed.

4. If at all possible a second physician experienced in anaesthesia should be present at the delivery. Proper anaesthesia is probably the biggest problem in the management of these cases in the small hospital. When it is required induction has to be rapid and relaxation complete. In the hands of the experienced, and with full realization of its danger, chloroform can be a very useful agent.

I prefer to conduct the delivery under local anaesthesia with a pudendal block using Xylocaine® 1 per cent. As a precaution, an intravenous drip is started so that if difficulty is experienced with delivery of the arms and aftercoming head the patient can be immediately anaesthetized with 5 to 6 ml of 2½ per cent Pentothal® (100-150 milligrams) along with Anectine® (60-100 milligrams) for muscle relaxation.

5. Always do an episiotomy and do it early when the buttocks are distending the perineum. Be sure it is a generous episiotomy.

#### THE DELIVERY

The actual method of delivery most widely accepted is termed an "assisted breech" delivery. This means allowing spontaneous birth of the breech to take place to the umbilicus. Hands and towels should be kept away until this occurs. This is of particular importance with a footling presentation where any attempt to apply traction from below before complete dilation of the cervix occurs will result in extension of the arms and head with resultant difficulty and trauma to the fetus.

Once the umbilicus has appeared and a loop of cord brought down the "assisted" part of the delivery takes place. Gentleness and the avoidance of haste are of the utmost importance. While the operator exerts gentle traction from below, the assistant maintains gentle pressure on the baby's head from above to keep the head in a

flexed attitude. This, coupled with the expulsive efforts of the mother, soon brings the inferior border of the scapula into view. Do not attempt to deliver the arms until the latter occurs.

It does not matter which shoulder is delivered first. Whichever arm is easiest of access is delivered by passing two fingers over the baby's shoulder and "wiping" the arm down over the infant's face. If an arm has become extended rotate the body of the infant completely and away from the affected extremity. This will free the arm and it can then be brought down easily. For example, with the baby's back on the mother's right and the anterior arm extended rotate the body of the baby counter-clockwise.

With the infant now resting astride the operator's arm and a forefinger inserted in the baby's mouth to maintain flexion of the head gentle traction combined with gentle pressure from above is usually sufficient to deliver the head. Once an airway is established to the baby's mouth haste is no longer necessary. Many operators prefer the routine use of Piper's forceps for the delivery of the aftercoming head. They should always be available at delivery and used if any difficulty is experienced in advancing the head through the pelvis, or undue traction is felt necessary. However, remember that any attempt to use them before the head is engaged carries the same risk as a high forceps in a cephalic presentation.

I feel that the most important factor in the safe conduct of a breech delivery is to avoid interference with attempts at traction before the baby is delivered to the umbilicus. Rather, one should rely on the expulsive efforts of the mother. Force from above is natural; force from below is not and will only result in extension of the arms and head and difficulty.

There is no place in Obstetrics where experience and judgment are more important than in the management of a breech delivery, particularly in the primipara. Efforts must be made towards lowering the perinatal mortality rate through constant attention to the details of management of the patient during her labor and delivery. □



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# The Use of X-Ray in Obstetrics

I. A. PERLIN, M.D.

*Halifax, N. S.*

During the past quarter century maternal mortality has decreased to extremely low levels and infant loss has diminished considerably. While many factors have contributed to this salvage not the least of these have been diagnostic radiological studies of the gravid uterus and the female pelvis. As happens with any new development enthusiasm ran high and X-ray evaluation of the pelvis became almost routine in every pregnant patient. There has been at times a tendency to supplant clinical judgment with radiological diagnosis, even though the latter is also subject to errors of interpretation. Never-the-less there is no doubt that the combined efforts of the radiologist and the physician doing obstetrics has led to a greater success rate in labor and delivery. In recent years there has been a leveling off in the number of radiological studies requested particularly in the sphere of routine pelvimetry. Many obstetricians and general physicians have discontinued this practice and X-ray only those cases which run into trouble. Whether this is good or bad I'm not sure, but in the light of the public fear of radiation hazards engendered by pronouncements by such august bodies as the National Academy of Sciences, National Research Council, curtailment of routine evaluation of pelvic size by X-ray may be justified. I hope, however, that such fears will not so reduce the use of radiological aides as to cause an increase in morbidity and mortality rates.

Let us consider for a moment the problem of radiation hazard. How much evidence is there that the amount of radiation used in carrying out a pelvic survey in the latter months of pregnancy is really serious? A review of the literature leaves one rather confused. Certainly there is no concrete evidence that somatic effects (that is, physical damage) is a real problem. Even the scare set off by reports by such workers as Stewart and her associates in England in 1956 who reported that there was an increased incidence of leukemia among children whose mothers had had prenatal abdominal X-rays has been refuted. The genetic effect, however, still has to be reckoned with and the geneticists seem to feel, although basing their statements mainly on the work done in flies and mice, that ionizing radiation will increase the mutation rate in humans. Hodges' says, "We

must accept the considered opinion of the geneticists, that for the welfare of the race any considerable increase in the mutation rate is undesirable and therefore we should avoid unnecessary radiation of the gonads of subjects who have not passed the child bearing age". While this may be a valid opinion, never-the-less our concern must be with the mother and her baby in the immediate future, lest we run the risk of producing "obstetrical cripples" and damaged babies which are more serious problems than the supposed genetic changes of later generations. It would appear to me that greater harm may well arise from the tendency to do routine "everything" such as GI series, IVP's etc. (since, the cost of X-raying patients is less to the patient now), in the non pregnant woman of child bearing age and in the case of patients with an early pregnancy from the fetal point of view. The time when most obstetrical films are of advantage is after 30 weeks gestation, when the danger from exposure as far as the baby is concerned should be least.

Let us now review those situations where Obstetrical Radiology may be helpful to us:

## **Pelvic Capacity**

Pelvic examination of the pregnant patient is of course important for several reasons, such as the diagnosis of the pregnancy, the presence of soft tissue problems, the presence of other pathology in the pelvis including evaluation of the cervix, etc. However, clinical estimation of pelvic size, with perhaps the exception of the outlet, is in the main guess work. The examining fingers may distinguish a marked contraction at the mid pelvis, but at the inlet even this distinction is more difficult. Pelvimetry, on the other hand, can tell us in accurate units of measure just how much room we are likely to have at these areas. The methods used in X-ray pelvimetry are many and no doubt most are accurate. We have found that the Thoms method has been most helpful for us, because first of all it gives a true inlet picture from which direct measurements can be made and the mid pelvic diameters are readily obtainable. Preferably before the patient is allowed a prolonged labor the size of her pelvis must be known



as accurately as possible. In the case of a primipara, in which the pelvis has never been tried, it would appear to me that the use of radiological estimation of the pelvis would be extremely important and once this knowledge is obtained the size of the pelvis remains about the same for all succeeding pregnancies.

### Progress in Labor

Even if one knows from previous deliveries or pelvic mensuration that the pelvis is adequate, one is often baffled by the progress during the present labor. Many factors could be at fault besides the pelvis, such as the contractions, position of the baby, the dilatability of the cervix etc. The X-ray, particularly an upright true lateral view could help in ruling out some of these possibilities such as presentation and position of the baby (which may be difficult to assess in the laboring woman) and the relationship of the presenting part of the pelvis with the degree of advancement.

### Presentation and Position of the Baby

We are at times not quite clear as to what the position and presentation of the baby happens to be, particularly during the course of labor in the presence of a contracting uterus. One can certainly mistake a breech with extended legs for a vertex. Equally it may be difficult to pick up a brow or face presentation. Here again the X-ray can be of immense help in setting the story straight. In talking about breech, particularly in a primipara, where the pelvic estimation is rather clouded, it certainly would be of extreme value to have an accurate estimation, particularly of the inlet, before the baby is delivered to the head, and then gets caught up in an unsuspected small area. Multiple pregnancies can often be only suspected and it takes an X-ray to make the diagnosis more definite. All of us can remember difficulties with the second twin presenting as a transverse presentation. Knowing that the second twin must be delivered relatively soon after the first one in order to keep the fetal loss down to a minimum, it has happened that the unexpected transverse presentation resulted in hand down and then the hazard of internal version is added to the delivery. If one could recognize that the second twin was in the transverse one might try to adjust the presentation before rupturing the second sac. Here again the X-ray during the course of labor might help in clearing up the mystery.

The tense uterus of polyhydramnios makes it difficult to assess the presentation and position of the baby or for that matter the state of the baby. Here there quite often is associated some abnormality of the fetus such as an anencephalic or a hydrocephalic and these should be recognized beforehand, if at all possible.

### Bleeding in the Third Trimester

The X-ray has been particularly helpful in those cases where the patient has a relatively small amount of silent bleeding and the baby still has some 6 to 8 weeks remaining to term. The question of diagnosis must be answered and yet it is rather precarious to examine the patient digitally to determine if there is a Placenta Previa because this might precipitate brisk hemorrhage necessitating a radical approach. It would be better if one could carry the baby a bit longer and thus conservative therapy is indicated. The use of placentography to outline the position of the placenta has been of considerable value in deciding what course of action one should take. There are many methods of placentography. The soft tissue technique is the one that we use because it has been as accurate as any other method and is the simplest to do. There is a claim that the newer methods using radioactive isotopes are not as hazardous from the radiological point of view. However, for small hospitals with limited availability of isotope banks these methods are really impractical.

### Problems

With recent advances in handling the Rh problem babies the X-ray has been invaluable in those cases where intrauterine transfusions are carried out.

### Other Uses

The X-ray may be helpful in diagnosing possible intrauterine fetal death, or it may be helpful in differential diagnosis of a secondary abdominal pregnancy. These other uses are perhaps very infrequently resorted to.

We can see from the foregoing that diagnostic radiology can be of immense benefit in the proper handling of our obstetrical patients. I make a plea that we not be stampeded into refraining from the use of the X-ray. I am not suggesting, by any means, that the routine use of radiological aids be done in every case, however, I certainly feel that at the least sign of trouble it is of immense value to get all the information possible before tackling the problem at hand. It is important that one does not rely solely on the radiologist's report but that all of us doing obstetrics should study the films ourselves and thus make this the combined effort that it should be. □

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# Pregnancy and Rh Antibodies<sup>1</sup>

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Intelligent supervision with strict attention to detail in pregnancies showing Rh antibodies will save babies' lives. Nevertheless it has been estimated that no less than one-half of the pregnant women in Nova Scotia continue to be deprived of Rh determination during pregnancy. The Medical Profession must, in all conscience, remedy this state of neglect until all gravid women are Rh tested.

In a given case in which Rh antibodies are detected a definite plan of investigation must be followed if the baby is to be safeguarded as much as possible. Therefore, at the first prenatal visit the Obstetrical history of a previously affected baby is noted in detail, including laboratory results if obtainable. *Even with a negative history*, blood is sent to the laboratory for Rh determination and, if Rh negative, testing for antibodies. If antibodies are detected early in pregnancy further blood specimens are obtained at monthly intervals for regular antibody titre estimations until the sixth month, every two weeks until thirty weeks, and then weekly.

All sensitised Rh negative expectant mothers should have an amniocentesis performed at about the thirtieth week of pregnancy, or earlier (even as early as the twentieth week) if the antibody titre is high. This is a relatively simple procedure in most cases but is not without possible complications. Approximately 10 mL of amniotic fluid is aspirated by means of a No. 20 spinal needle inserted through the abdominal wall and into the amniotic sac. This is performed with the aid of a local anesthetic. The fluid thus obtained is submitted to the laboratory for bilirubin content estimation by means of a spectrophotometer. A quantitative estimation of the liquor bilirubin is also obtained.

More specifically the bilirubin content of the liquor amnii is plotted against the stage of gestation to determine the risk to the affected foetus. This fact helps greatly in assessing the case and thereby determining when best to induce labour. However, one must assess every case by using the clinical data such as history, size of foetus, presence of some degree of hydramnios, the blood

antibody titre estimation and the liquor amnii bilirubin content. Only with all this information should the decision be made as to how and when induction is to be carried out.

A suggested practical scheme of management to correlate the bilirubin levels with the stage of pregnancy would be as follows:

Liquor Bilirubin Level mg per 100 cc	Induce at
Over 0.30	33-34 weeks
0.20 - 0.29	34-35 weeks
0.14 - 0.19	35-36 weeks
0.08 - 0.13	36-47 weeks
0.07 or less	40 weeks

Vaginal delivery is the method of choice in the interests of these affected babies but sometimes, when attempted induction much before term fails, Caesarian Section must be performed.

What can be done for the grossly affected baby as donated by the history; very high blood antibody titres early in pregnancy; extremely high bilirubin content in the liquor amnii? In these desperate cases intrauterine blood transfusion of the foetus must be performed if the baby is to have any chance of survival. This procedure has been performed ten times involving six patients in the past year in Halifax (four cases, had two such transfusions) with the salvage of three of the infants who remain alive and well. This foetal salvage rate of 50% compares favourably with other centres where this treatment has been adopted.

The method was first described by Liley<sup>(1)</sup> of New Zealand. An 18 cm. 16 gauge Tuohy needle is inserted under local anesthesia, through the abdominal wall and on into the peritoneal cavity of the foetus. The preliminary injection eight to ten hours previously of 20 c.c. of a 76% solution of Renografin into the amniotic cavity allows the foetus to swallow this contrast medium with resulting opacity of the foetal bowel. (Figure 1.) This aids in the subsequent location of the tip of the Tuohy needle within the foetal peritoneal

<sup>1</sup>From the Committee of Fetal Maternal Incompatibility, Medical Society of Nova Scotia.



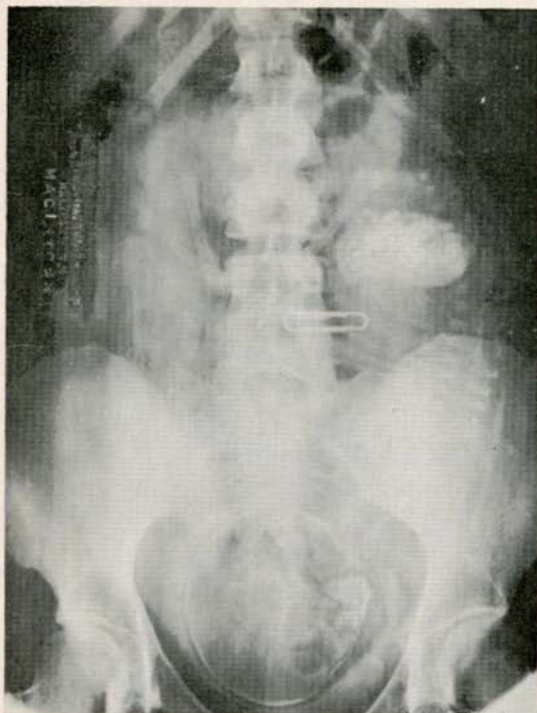


Figure 1. Contrast medium in fetal intestine.

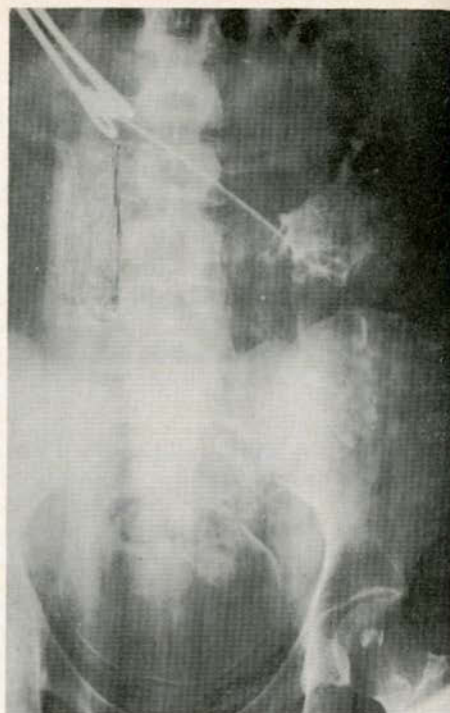


Figure 2. Needle in fetal abdomen. Additional contrast medium shows outside intestine.

cavity (Figure 2.) An epidural catheter is fed through the lumen of the Tuohy needle which is then withdrawn. 70 to 100 c.c (depending on the estimated size of baby) of freshly prepared packed cells is injected through the epidural catheter into the peritoneal cavity of the foetus as it lies in utero. This blood is thus absorbed by the foetus and the pregnancy can be prolonged. Ten days later the procedure is usually repeated. Following this second transfusion the pregnancy is allowed to continue for a further two or three weeks and then induction is attempted. If the Induction fails a Caesarian Section may have to be performed. Immediately after birth the baby will probably require one or more exchange transfusions.

A Committee consisting of four Obstetricians and three Paediatricians has been formed in Halifax to consider these cases of Rh incompatibility. This Committee meets weekly to consider cases submitted by Doctors in the Province. We feel that this service is of value in aiding doctors in the particular problems which arise in these cases.

Any Doctor, who has a patient showing Rh incompatibility, is invited to phone (collect) or write to:

Committee of Fetal Maternal Incompatibility,  
5821 University Avenue,  
Halifax, N. S.  
Phone 422-6501 (Obstetrical Resident on Duty)

□

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# Treat Preeclampsia Early

G. H. FLIGHT, M.D.

Halifax, N. S.

Toxemia of pregnancy accounts for 20 per cent of all maternal deaths, is a potent cause of fetal wastage and a major etiological factor in prematurity. This is so because the dangers from well established preeclampsia are: - Abruptio Placentae, intrauterine death of the fetus, and eclampsia.

To reduce the complications from this syndrome of hypertension, fluid retention and albuminuria, it is imperative that the diagnosis be made early. This is possible since the natural evolution of this disease is from a *stage of signs* through a *stage of symptoms* to a *stage of convulsions*. In some cases the final stage is abruptio placentae with intrauterine death of the fetus, instead of convulsions.

The main principle of management is to modify the *stage of signs* so that delivery may safely be achieved before symptoms, convulsions or other catastrophes supervene. The sooner the signs are detected and appropriate action taken the greater the chance of a successful outcome for both mother and child. It is thus far more important to emphasize the first hints of impending toxemia than to describe in detail the later stages which should seldom be seen nowadays.

In an obstetrical population it is possible to pick out the patients who are most likely to develop toxemia. These patients then become suspect and as far as toxemia is concerned can be considered high risk. They are: -

1. The primigravida - especially the teenager.
2. The patient with essential hypertension.
3. The patient with chronic renal disease.
4. The patient with a labile blood pressure.
5. The Diabetic and the pre-diabetic.
6. The short stocky female.
7. The patient with a previous history of toxemia.
8. The abnormal weight gainer.
9. The obese woman.

Armed with this information, the doctor is on the lookout for toxemia in his obstetrical patient. The diagnosis is aided by the fact that in the average case there appears to be a progression from fluid retention with increased weight gain, to hypertension and finally albuminuria.

**Weight Gain.** A weight gain of more than one pound a week may be taken as indicative of excessive fluid retention in the tissues. Preeclampsia usually appears after the 30th week of pregnancy - although it may present sooner in the case of hydatidiform mole, multiple pregnancy or pre-existing hypertension or renal disease - and it is during the final 10 weeks of pregnancy that abnormal weight gain is especially to be looked for. As a rule the woman whose toxemia presents fluid retention as the main feature arouses less anxiety than the one in whom hypertension is more prominent; indeed in the absence of hypertension or albuminuria it may not be easy to decide whether or not the diagnosis of toxemia is fully justified. The best plan in such a situation is to deal with the case as one of toxemia unless some other explanation of the fluid retention or edema is forthcoming.

**Hypertension.** While a blood pressure of 140/90 mm/Hg or above is generally regarded as the criterion for diagnosis of preeclampsia, one must remember that in young girls whose normal blood pressure may be 100/60, a rise to 140/90 is quite significant. It is probably better to choose a rise of 30 mm in the systolic and 15 mm in the diastolic as being significant. Certainly one does not need to wait for albuminuria to make a diagnosis of preeclampsia.

**Albuminuria.** The presence of albumin in the urine reflects vascular spasm, ischemia and necrosis in the renal vessels and in this event a similar process may well be at work in the uteroplacental circulation. Once albumin leaks into the urine the risk of placental failure in one form or another is very real. Hypertension and edema may be observed with relative impunity, but to treat conservatively the woman with albuminuria is hazardous. Of course one must attempt to make an accurate diagnosis and be sure that the albuminuria is not on the basis of renal infection or that it had not been noted in early pregnancy indicating pyelonephritis or some other renal disease.

The management of toxemia of pregnancy may be described as rest and sedation until delivery. The object should be to treat the disease



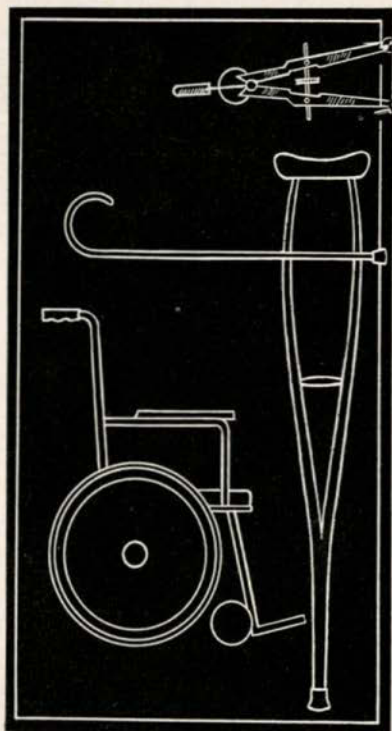
in the stage of signs and not wait for symptoms to occur. Specifically one should be very strict with the caloric intake for the abnormal weight gainer and to omit salt from the diet when fluid is present. In addition to this, diuretics given intermittently in therapeutic doses may be given on an out patient basis. These patients should be seen every week and if the blood pressure rises further or fluid retention increases, despite these simple measures, admission to hospital is imperative. One should not wait for albuminuria to develop before hospitalizing the patient. So long as the situation improves, or at any rate remains static, the pregnancy may be allowed to continue. Once the last 2 - 3 weeks of pregnancy are reached induction should be considered as there is little to be gained in terms of fetal maturity and much to be lost if placental failure occurs. A good deal depends on the obstetrical circumstances - for example, the reliability of the dates, the estimated size of the baby and the state of the cervix - and each case must be judged on its merits.

In the very occasional case in which induction fails or the toxemia assumes a more fulminat-

ing form cesarean section may require consideration. *Any indication for induction should be strong enough to justify cesarean section* if the induction fails. The dividing line between intervention and meddlesome obstetrics is always a narrow one, and in the case of toxemia interference should be deferred until the risks to mother and child are thought to out-weigh those inherent in induction and premature birth.

### Summary

In handling obstetrical patients one must be on the lookout for the development of pre-eclampsia and initiate simple measures early, even to the point of over treatment, so as to modify the natural history of the disease until the patient is in the later weeks of pregnancy when delivery can be achieved with relative ease. Until such time as the etiology and pathology of this condition is elucidated, opening the way toward specific therapy and finally to prevention, all charged with the care of obstetrical patients must exercise constant vigilance. □



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## Secondary Amenorrhea

DOUGLAS CUDMORE, M.D.

Halifax, N. S.

**Case Presentation;** Mrs. S. G.

**Chief Complaints;** Cessation of menstruation, infertility.

**History of present illness;**

25 year old female. Secondary amenorrhea since age twenty. Menarche occurred at age sixteen and regular menses continued for the next two years. During the next year she had only four periods, though all were normal in character. At age 20 she was married and has not menstruated since. She has never experienced dysmenorrhea.

During her five years of marriage she and her husband have not practised birth control and no pregnancies have occurred.

**Pertinent functional Inquiry;**

The patient is a registered nurse and is enjoying good general health. There is no history of change in weight. There is no evidence of any emotional or marital problems (husband was also interviewed). The patient does not have headaches or visual disturbances. There is no heat or cold intolerance or change in the texture of the skin or hair. There has been no change in voice or distribution of body hair.

**General Physical Examination;**

The patient is a well developed white female measuring 5'2" in height and weighing 130 lbs. There are no visual field deficits and no evidence of papilloedema. The thyroid is normal to palpation and the texture of the skin and hair is normal. There is no evidence of hirsutism. The breasts are normally developed. The remainder of the physical examination is within normal limits.

**Pelvic Examination:**

Normal external genitalia. There is no clitoral enlargement. Vagina appears healthy and examination of a vaginal smear reveals moderately good estrogen support. The cervix is healthy and Papanicolaou smear Class I. The uterus is of normal size, and is mobile. Both ovaries are palpable and normal in size.

**Special Examinations and Laboratory Studies:**

Husband's sperm count: sperm of normal quantity and quality. Endometrial biopsy - proliferative endometrium Progesterone withdrawal test - 2 days of light bleeding. Hysterosalpingo-

gram - both fallopian tubes patent with no evidence of local pathology of the uterine cavity.

The following laboratory studies were all normal: Hemoglobin, White blood cell count, urinalysis, ac and 2½ hr. pc sugar, chest X-ray, skull X-ray, protein bound iodine, and the twenty-four hour urinary excretion of 17-ketosteroids 17-hydroxycorticosteroids and pituitary gonadotropins.

**Diagnosis:** Secondary amenorrhea of functional origin.

**Treatment:**

A. The patient was sent home for three months during which time she recorded her basal body temperature daily. At the end of this time her amenorrhic status had not changed and her basal body temperature remained monophasic (anovulatory).

B. The patient was then discharged on the first half (3 months) of a double blind study comparing the effectiveness of a placebo and Clomiphene citrate (Clomid), a new oral agent being used for the treatment of anovulation. At the end of three months she still had not menstruated and her basal body temperature was persistently monophasic.

C. During the next three months of the study the patient had two apparently normal menstrual periods. Both of these were associated with a luteal phase rise in the basal body temperature (ovulation) and endometrial biopsy on both occasions revealed secretory endometrium.

Upon breaking the code of the double blind study it was found that the patient received placebo during the first three months and Clomid during the last three months.

**Discussion:**

The investigation and treatment of infertility due to secondary amenorrhea is based on a clear understanding of the physiology of menstruation and an awareness of the more common conditions responsible for these symptoms.

Table I provides a brief outline of such conditions. All the investigations including the history and physical examination are orientated by such an outline. (See table II).



TABLE I THE COMMONER CAUSES OF SECONDARY AMENORRHEA

1. Physiological	— Pregnancy, Menopause
2. Systemic Conditions	— Severe Diabetes, Advanced Malignancies, Severe Malnutrition, Obesity
3. Hypothalamic Dysfunction	— Psychogenic, Chiari-Frommel Syndrome Pseudoeyesis
4. Pituitary Disorders	— Sheehan's Syndrome, Tumours
5. Thyroid Disorders	— Myxedema, Thyrotoxicosis
6. Adrenal Disorders	— Adrenal Hyperplasia, Tumours
7. Ovarian Dysfunction	— Stein Leventhal Syndrome, Tumours, Premature Ovarian Failure
8. Uterine Disorders	— Refractory Endometrium Intrauterine Synechiae (Asherman's Syndrome)
9. Idiopathic Disorders	— Functional Amenorrhoea (Ovulatory Failure)

TABLE II OUTLINE OF INVESTIGATIONS

1. Thorough history
2. Complete physical examination
3. Pelvic examination
4. Endometrial biopsy or progesterone withdrawal test
5. If investigations are for infertility - (a) examination of husband's semen  
- (b) hysterosalpingogram
6. Laboratory studies - Hemoglobin, WBC, Urinalysis, Skull X-ray, Chest X-ray,  
Protein bound iodine, 24 hour urine collections assayed for:
  - (a) 17-Ketosteroids
  - (b) 17-hydroxycorticosteroids
  - (c) pituitary gonadotropins.

If infertility is the prime objective of investigation an examination of the husband's semen is indicated after the woman has had a thorough history and physical examination (including a pelvic examination) and before proceeding to the special examinations and laboratory studies.

Such investigations provide more than a step towards the treatment of infertility. They provide an opportunity to detect serious underlying disorders (eg. tumours) and thus allow prompt treatment. Also, they provide considerable psychological relief to the patient who not uncommonly is anxious about her lack of monthly inconvenience.

Although the list of causes which can result in secondary amenorrhoea is rather large, more often than not the investigations fail to reveal a specific, and usually more easily treatable, disease. This leaves the physician with that rather nebulous diagnosis of "secondary amenorrhoea of functional origin".

Our understanding of the pathophysiology of functional amenorrhoea is still incomplete. However the basic defect appears to be persistent failure of ovulation. Therapy therefore should have as its objective the stimulation of ovulation.

Therapeutic stimulation of ovulation in the past has been unrewarding. At the present time results are more encouraging with the use of human pituitary gonadotropin preparations and Clomiphene citrate.

The scarcity of human pituitary preparations

precludes its widespread clinical use at the present time.

For the past two years Clomid has been used on a clinical research basis in this centre for the treatment of functional amenorrhoeic and oligomenorrhoeic women in whom the only defect appeared to be failure of ovulation. Clomid is a non-steroid compound related to TACE which has been shown capable of inducing ovulation in a high percentage of cases. It may be given orally and its toxicity and side-effects are few if given in the proper dosage and the patients are closely followed-up.

In the study carried out in this centre Clomid and an identical placebo were used in a carefully controlled double blind study. Each patient received placebo or Clomid for three months and during the subsequent three months the alternate medication was given. The identity of the medication was not revealed until completion of the entire study.

The results of the study may be summarized as follows:-

- (a) 10% of patients began menstruating (ovulatory) during their investigations or before beginning treatment - thus in some cases this is a self-limiting disease.
- (b) 20% of patients responded (ovulatory) to placebo - thus in some cases there is a psychogenic factor which may not be obvious.
- (c) Approximately 50% will respond to Clomid (eg. as did Mrs. S. G.).
- (d) 20% failed to show any response.

□



# Carcinoma of the Cervix in Pregnancy

B. EPSTEIN, M.D.

Halifax, N. S.

Carcinoma of the cervix coexisting with pregnancy is rare, the incidence being reported from 1:2500 to 1:22,000 deliveries. Pregnancy complicating carcinoma of the cervix, however, occurs in one to three percent of the cases. The average age at which this disease is discovered in pregnancy is 35, and parity approaches five. The most common symptoms are persistent vaginal bleeding (80%) and discharge (20%). In only six percent of the cases a visible mass is present on the cervix. In seven percent the carcinoma is not discovered until late in labor, when the patient is examined vaginally to determine the cause of dystocia. Seven to ten percent of the cases of carcinoma of the cervix in pregnancy are asymptomatic. The following case report illustrates some of the above findings.

Mrs. A., a 29 year old white female Gravida five had her last menstrual period August 15/63. Her periods were prolonged but regular, 10-14/28. She had no history of vaginal discharge, or post coital bleeding. Three months later she consulted her physician and the diagnosis of pregnancy was established although no speculum or cytologic examination was carried out. At 23 weeks gestation she developed painless bleeding *per vaginam*. The physician attributed this bleeding "to a miscarriage" and she was advised to rest for two weeks. No pelvic examination was performed. The bleeding subsided although she continued to have a foul smelling brownish vaginal discharge. She again consulted her physician who assured her without pelvic examination that she was still "threatening to have a miscarriage, and that nothing further than rest was indicated."

In March/64 the patient was seen in the Emergency Department of the Victoria General Hospital because of heavy vaginal bleeding. Abdominal examination revealed the pregnancy to be approximately 30 weeks. Pelvic examination was not carried out, and the patient was transferred to the Grace Maternity Hospital with a tentative diagnosis of placenta previa. Bleeding subsided, and arrangements were made for the patient to return to the prenatal clinic, and to have a placentogram at that time. Careful speculum examination at clinic in her 33rd week of pregnancy revealed the posterior lip of the cervix to have a granular exuberant appearance resembling a cervical eversion. Cytologic smears were reported

as suspicious. (Class III). Before repeat smears could be made the patient was readmitted to hospital because of recurrent vaginal bleeding. The placentogram showed no evidence of previa. Speculum exam was repeated, and the posterior lip of the cervix was biopsied. Biopsy was reported as invasive carcinoma of the cervix. In order to obtain a more mature fetus, the patient was kept in hospital until the 36th week of pregnancy. At this time a low transverse Caesarean Section was performed with delivery of a living female infant weighing five lbs. Her post operative course was complicated by pneumonitis which responded to therapy. Ten days post operatively she was transferred to the Victoria General Hospital for radiation therapy. At present she is alive and well.

This case serves to illustrate the following points:

1. The need for every woman, pregnant or not pregnant to have pelvic examination and cytologic studies. It is known that seven percent of all cervical carcinomas occur in women under 30 years of age. In a study at M.D. Anderson Hospital, the youngest patient with carcinoma of the cervix in pregnancy was 19 years. We have seen a case in a 20 year old.

2. The cause of bleeding in pregnancy should be established whenever possible. Vaginal bleeding at 23 weeks gestation diagnosed as being due to miscarriage is untenable without visual examination of the cervix.

3. While painless bleeding in late pregnancy may be attributed to placenta previa, and digital pelvic and rectal examination are contraindicated in order to prevent serious hemorrhage, careful speculum examination is essential to exclude other causes.

4. The prognosis becomes extremely poor if the fetus is allowed to deliver through an untreated carcinomatous cervix.

5. The clinical stage of the carcinoma in pregnancy, as in the non pregnant, is regarded as the most important criterion of prognosis. Delay in diagnosis leads to a poor prognosis. Early detection is imperative if we are to improve the present overall five year survivals of 44 to 55 percent.

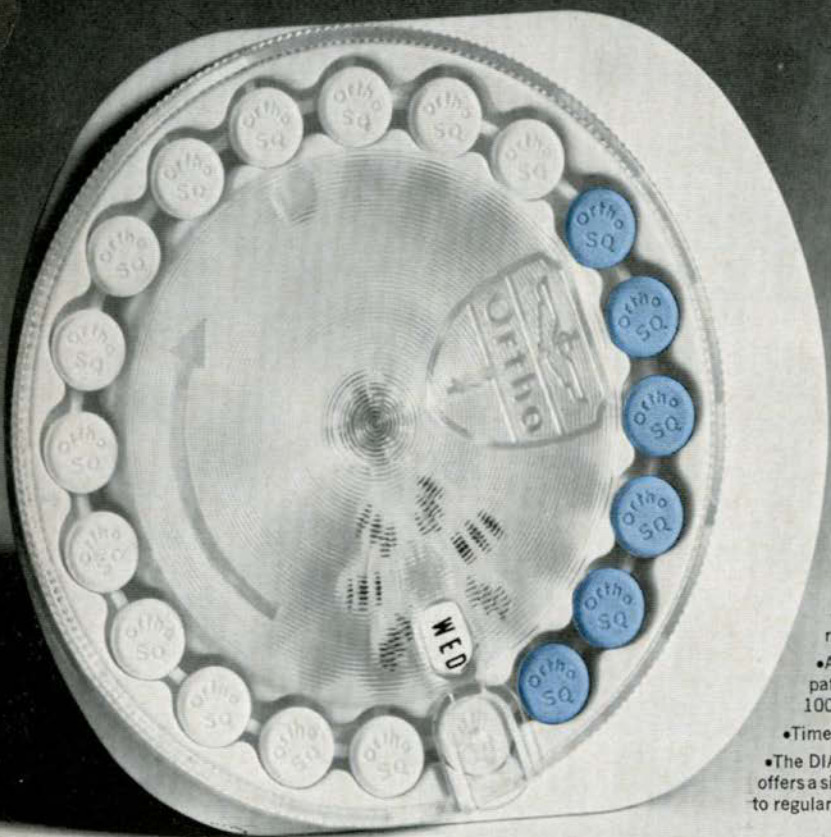
6. Vaginal bleeding at any age from the cradle to the grave means carcinoma of the cervix until proven otherwise. □



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## Personal Interest Notes

Last month the Federal Election was occupying everyone's thoughts, - especially those doctors who were candidates. To those who won our congratulations, - to those who lost, well-better luck next time. This month, in New Waterford, **Dr. Nathanson** is running for Mayor, complete with a 75 car motoreade and a combination get-together rally, and local folk festival which packed the Assumption Hall. **Dr. Nathanson**, a Glace Bay native, who has been a medical practitioner in the town for the last ten years, and took a leading part in the planning and realization of the community's new hospital, was the principal speaker and stressed the importance of utilizing every available resource to open up new projects and obtaining expert guidance in municipal affairs.

In Stewiacke, **Dr. Harry B. Havey** who has been mayor since 1921 will not seek re-election this year. Forty years is an honourable term of service in civic government for anyone, especially an active physician.

**Dr. J. S. Munro** of North Sydney was returned as Mayor by acclamation.

### ANTIGONISH-GUYSBOROUGH MEDICAL SOCIETY

Named to the executive of St. Francis Xavier University Alumni Association were the following doctors, for varying terms of service: **Dr. William Reid**, Sydney, **Dr. T. L. Sullivan**, Sydney, **Dr. Marjorie Smith**, Halifax, and **Dr. Robert Greening**, Antigonish.

### CAPE BRETON MEDICAL SOCIETY

A one-day workshop under the sponsorship of the local branch of the Canadian Mental Health Association was held during November in Sydney. It was conducted by **Dr. Raymond Prince**, lecturer in Psychiatry at McGill and an executive of the Family Service Council of Montreal.

At a meeting of the Board of Directors of the Sydney branch of the Canadian Arthritis and Rheumatism Society, **Dr. Austin Macdonald** reported on the consultative clinics held monthly in Sydney, New Waterford, Glace Bay and Northside, and told the meeting of the second successful annual meeting held in Inverness, October 8, 1965.

In New Waterford, **Dr. Michael Laffin**, the community's representative in the N.S. House of Assembly, spoke at Central High School's war memorial observances on November 10. He is an alumnus of the school as well as a former R.C.A.F. Flight Lieutenant and prisoner of war. **Dr. Laffin** also spoke before a largely attended meeting of the Mount Carmel Home and School Association on the school building programme and its requirements.

**Dr. Jim Cruickshank**, who has been practising in Sydney as a neuro-surgeon has accepted a position in Portland, Oregon.

### HALIFAX MEDICAL SOCIETY

**Dr. J. K. B. Purves** and **Dr. A. Shears** attended the 3rd Annual Symposium on "The Medical Aspects of Sport" in Toronto on

November 25th. **Dr. John C. Szerb**, head of the Department of Physiology and Biophysics at Dalhousie has been appointed to the Medical Research Council of Canada, and also to the sub-committee on clinical research.

**Dr. H. H. Tucker**, Halifax, speaking, to a report submitted by the Traffic Accidents Committee, advised the establishment of "Trauma Teams" throughout the province to treat seriously injured accident victims. A head team of various specialists would be stationed at Halifax whose function would be to train other teams to work in the province.

More than 250 delegates to the Atlantic Provinces Physical and Recreation Association Convention turned out in Dartmouth recently to hear **Dr. Charles M. Harlow**, director of laboratories at Camp Hill Hospital and **Dr. Charles Macdonald**, surgical adviser to St. Mary's University Athletic Department.

The committee of the Dartmouth Medical Society who are to act as an advisory group to the Hospital Committee on medical problems in order to accelerate the erection of a hospital in Dartmouth, is composed of **Dr. Robert Wentzell**, chairman, and **Drs. W. Verge, F. Hanco, D. Johnson, D. Morris, A. Hansen, P. F. Ferguson** and **C. H. Young**.

### VALLEY MEDICAL SOCIETY

**Dr. Grant Worthylake** and **Dr. N. A. Toes** have been appointed medical examiners for King's County. They succeed **Dr. Earle Reid** who has left for postgraduate work.

### CONGRATULATIONS

To **Dr. Anne Linder Hammerling** who was the first woman to be given a testimonial dinner by the Halifax Jewish community. **Dr. Hammerling** has kept up her own medical practice, has two grown up daughters, both of whom were married last summer, one to a doctor and the other a



May graduate in Medicine herself. She has given tremendous assistance to Bonds for Israel and the Hadussah programmes for medical aid in Israel.

Last month we congratulated **Dr. Walter C. MacKenzie** and now again we salute him on his being voted president-elect of the American College of Surgeons at the annual clinical congress in Atlantic City N.J. As is well known Dr. MacKenzie is Dean of Medicine at the University of Alberta and President of the Royal College of Physicians and Surgeons of Canada.

**Dr. Ian Gilchrist** and family have taken up residence at Moose Factory, Northern Ontario. The people served by the hospital are largely Cree Indians and Eskimos. Emergency trips to and from the hospital have to be made by plane. Fifty below zero will be a change from the moist heat of Angola or the Congo.

And now, as Christmas approaches, our doctor yachtsmen regretfully lay away their gear and wait for spring to come. Yet some of them can look through the long winter at the trophies they have won and plan new stratagems for when they go down to the sea again. Our congratulations to the Halifax and Dartmouth doctors who at the Annual Prize Presentation of the Royal Nova Scotia Yacht Squadron held on November 12 won one or more of the various awards. These are Dr. A. Trias - a tankard; Dr. Gordon Bethune - five awards; Dr. N. B. Trask - three awards; Dr. John Filbee - two awards; Dr. M. G. Tompkins - one award; Dr. H. H. Tucker - two awards; and Dr. B. F. Miller - one award.

#### BIRTHS

To **Dr. and Mrs. Auyuab Mohammed**, (Mary Ling), a son, Ian Jamal, at the Grace Maternity Hospital, Halifax, on November 20, 1965.

To **Dr. and Mrs. R. E. Munroe**, (née Noreen Keyes), a daughter, Heather Ann, at Soldiers'

Memorial Hospital, Middleton, N. S. on November 15, 1965.

To **Dr. and Mrs. Jodh K. Sanghi**, (née Yvonne Smith), a daughter, Krishna Maia, at the Halifax Infirmary, on November 19, 1965.

To **Dr. and Mrs. R. A. Wentzell**, (née Doris Langille), a daughter, at the Grace Maternity

Hospital, Halifax, on October 26, 1965.

#### OBITUARIES

We regret to record the death during November of **Dr. Charles Homans**, graduate of Dalhousie in 1926, who until recently was on the staff of Camp Hill Hospital and also practised in Hubbards. □



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## FORTY YEARS AGO

From The Nova Scotia Medical Bulletin

January 1926

### FOCAL INFECTION

It might seem superfluous to insist that in all organs giving rise to focal infection, the better the drainage, the less the chance of serious systematic disease. The experience of the abstractor however, has led him to doubt whether all of the profession realise this. To make a diagnosis for the purpose of illustration: - Every one now recognises that the tonsil is a very important factor in focal infection. The crypts of this organ constitute its natural drainage system, and if they are open and the tonsil free and not buried, the probability is that infection will not occur. Yet one often sees tonsils that have been partially removed, with the whole remaining surface covered by scar tissue, so that whatever infection that may remain in the tonsil is effectively sealed up. As a consequence, the latter condition of the patient is worse than the former, as the partial operation has totally deprived the tonsil of its only natural source of drainage. The majority of medical consultants would, one thinks, urge that if the tonsil cannot be completely removed, it had better not be touched.

The causes of chronic sinus are classified as predisposing and exciting. The predisposing causes are mainly anatomical. Any anatomical irregularity in the nose, by which the nostril is narrowed, and the drainage interfered with, makes a person more susceptible. The great offender is the deviated septum, with the high deviation that touches, or almost touches the middle turbinate. This causes chronic congestion and swelling of the mucous membrane in the region where the natural outlets of the sinuses are situated. Fortunate indeed in this climate is the person with a straight septum and normal turbinate.

The exciting cause is, of course, the acute attack which to a greater or less extent occurs in almost every attack of Coryza. In the well drained nose, the majority of cases recover spontaneously. Every case of Coryza would clear up much more quickly and comfortably if the patient were put to bed and kept quiet for a few days. One has scarcely ever seen a patient who would be willing to do this for a "mere cold in the head."

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