

FISTULA CARE

URINARY CATHETERIZATION FOR PRIMARY AND SECONDARY PREVENTION OF OBSTETRIC FISTULA



**Report of a Consultative Meeting to Review and
Standardize Current Guidelines and Practices**
March 13–15, 2013 at the Sheraton Hotel, Abuja, Nigeria



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Contents

Acknowledgments	1
Executive Summary	3
Introduction	6
Conservative Management of Obstetric Fistula	8
Background and Definitions	9
Consensus and Recommendations	10
Treatment Pathway: Conservative Treatment of Fistula in Settings With and without Specialized Fistula Care Services	11
Review of first steps in conservative treatment pathway	15
Conclusions	18
Urinary Catheterization to Prevent Obstetric Fistula	20
Background and Definitions	20
Recommendations	23
Barriers to Implementation Identified	24
Identified Future Research Needs	24
Conclusion and Next Steps	26
References	28

Figures

Figure 1. Flow chart: algorithm for conservative treatment of obstetric fistula by urinary catheterization	13
Figure 2. Definition of terms: prolonged and obstructed labor	20
Figure 3. Flow chart: urinary catheterization to prevent obstetric fistula	25

Appendixes

Appendix 1: Meeting Participants	30
Appendix 2: Meeting Agenda	32
Appendix 3: Literature Review: Synthesis, Citations, and Summaries by Theme	34

Appendix 4: Recommendations for Guidelines on Urinary
Catheterization to Prevent Obstetric Fistula 45

Acknowledgments

The USAID-supported Fistula Care project led by EngenderHealth offers sincere thanks to our colleagues who participated in the meeting for their collaboration and lively contributions. We also thank them for their constructive feedback and additions to the draft report.

Expert fistula care providers and managers at the consultative meeting unanimously supported the concept of urinary catheterization for conservative treatment of obstetric fistula and reached a firm consensus on the simplified approach outlined in this report. In addition, preliminary recommendations were made for urinary catheterization for fistula prevention that provide a useful basis for further discussion. Guidelines such as these will be expected to strengthen the culture of medical care based upon best-practices that are founded on clinical evidence.



Catheterization Consultative Meeting participants in Abuja, Nigeria

Fistula Care thanks the United States Agency for International Development (USAID) for its support of this meeting.

Staff members from the Fistula Care project Nigeria who organized and conducted the meeting were Iyeme Efem, Adamu Isah, Abimbola Olaniran, and Bukola Oluyide. In-country administrative and logistical support was provided by James Haruna, Eberechukwu Okeke, and Victor Ukoh.

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Executive Summary

Obstetric fistula predominantly results from prolonged or obstructed labor. The conventional treatment for fistula is surgical repair. However, data from the pioneering work of Kees Waaldijk in Nigeria over the last two decades suggests that women with obstetric fistula who present soon after the injury may heal without surgery if the bladder is drained with a catheter (Waaldijk, 1994, 2004). It is estimated that early management with a catheter could lead to closure of the fistula in up to 25% of suitable cases. This important finding has the potential to spare some women the need for surgical repair of their fistula. Surgery is both an additional trauma for women as well as a huge drain on the scarce resources in countries where fistula is common. Thus the concept of treating fistula conservatively and perhaps even preventing it by urinary bladder catheterization during or immediately after prolonged or obstructed labor offers a promising alternative approach.

In March 2013 Fistula Care convened a consultative meeting in Abuja, Nigeria, to review current guidelines and practices, to discuss knowledge gaps, and to develop recommendations for standardized approaches to urinary catheterization for prevention and conservative treatment of fistula. The meeting brought together a group of expert Nigerian and international fistula surgeons with experience of catheterization practices, representatives of national and international professional nursing and midwifery associations, and officials from Nigeria's Federal Ministry of Health, as well as national and international staff from the EngenderHealth-led Fistula Care project.

In preparation, Fistula Care conducted a pre-meeting review of pertinent literature. As is true of many other fistula-related issues, the published literature on urinary catheterization to prevent obstetric fistula is very limited. A synthesis, citations, and short summaries of the resources reviewed are included at the end of this report (Appendix 3).

Meeting discussions were also informed by the results of an informal survey carried out in advance of the consultative meeting, of current catheterization practices among

fistula service providers at both Fistula Care–supported and non-supported sites in Nigeria.

Key findings from meeting discussions were as follows:

- **Urinary catheterization practices in Nigeria vary widely.** The informal survey findings revealed that while fistula surgeons do generally practice urinary catheterization for conservative treatment of fistula, there is wide variation in the way that treatment is implemented: Very few of the providers surveyed reported the existence of written treatment protocols at their facilities; the average duration of catheterization for conservative treatment ranged from two to six weeks; and inclusion criteria ranged from “small fistula only” to “any woman who is leaking.”
- **There is need for pre- and in-service education on fistula prevention and treatment and competency-based training in catheter insertion and management.** Participants recommended that fistula prevention, case identification, and treatment modules and competency-based training in catheter insertion and management be included in pre-service education of midwives and other midwifery service providers, such as nurses and community health extension workers (CHEWs).
- **The following knowledge gaps were identified in prevention and treatment:**
 - **Prevention:** Research is needed to evaluate the safety, effectiveness and costs of bladder catheterization to prevent fistula. Also needed is a KAP survey of community- and facility-based providers to shed light on how to overcome implementation challenges.
 - **Treatment:** Participants identified the need for future research on outcome predictors for conservative treatment of fistula by urinary catheterization and for a comparison of outcomes for the range of causative injuries (and specifically, for a comparison of outcomes for obstructed labor versus surgical trauma).

Discussions reached consensus on two main recommendations:

- **A simplified, standardized approach to conservative treatment of fistula by catheterization.** A simplified treatment pathway was developed that could be used for specialized fistula repair facilities as well as for facilities without specialized fistula services (Fig 1).
- **Catheterization during and immediately after prolonged or obstructed labor.** To prevent fistula, a provisional recommendation was made, based on existing clinical guidelines, to catheterize all women following prolonged or obstructed labor and prior to assisted delivery or cesarean section. Participants proposed that the duration of catheterization following prolonged or obstructed labor should be 14 days and suggested that the procedure could be performed across the whole range of health facilities, from tertiary down to primary level (and also, potentially, during homebirths if delivery is attended by a trained health provider with midwifery competencies, skilled and authorized to insert and manage a urinary catheter). However, regarding this preventive intervention, there was uncertainty about the strength of the evidence and the feasibility of implementing it. The consultative group agreed on the need for further discussion at other levels of the health care system, including technical working groups and provider networks before finalizing the guidelines.

This meeting was a first step to assist the Nigerian Ministry of Health to develop recommendations that would lead to finalized national guidelines for urinary catheterization for fistula prevention and treatment, and ultimately, to the dissemination and implementation of the guidelines. Fistula Care will, in collaboration with the Ministry of Health, present the meeting report and recommendations to the national Fistula Provider Network and then to the Obstetric Fistula Technical Working Group for the finalization of guidelines. Afterward, the report will be disseminated to other key stakeholders, partners, and regional- or global-level professional groups. The meeting's conclusions and recommendations will be relevant to a wider audience of stakeholders and may in addition provide a foundation for the development of global guidelines.

Introduction

In Nigeria today, many more mothers survive childbirth than they did twenty years ago. Since 1990, the maternal mortality ratio has decreased by 41%, from 1100 deaths per 100,000 live births to 630 in 2010 (WHO, 2010).

Despite this impressive achievement, Nigeria is thought to bear the heaviest global burden of obstetric fistula, with an estimated 200,000 existing cases and 20,000 new cases occurring annually according to old estimates, although new estimates indicate the number may be closer to 12,000 new cases annually (Nigeria Ministry of Health, 2012). Ambitious targets have been strongly endorsed by President Good Luck Jonathan (News 24 Nigeria), with the goal of performing free repairs for up to 66,000 women in 2013. Achieving this goal presents enormous challenges, partly because of the financial resources required but also because of shortages of appropriately trained personnel and equipment and the uneven distribution of Nigeria's skilled health workforce. Approximately 6,000 repairs are performed every year, and at predicted rates it will take many years and huge investment to clear the ever-increasing backlog of women suffering from this devastating condition. This challenge also underlines the importance of preventing fistula from occurring in the first place.

In March 2013, the USAID-funded and EngenderHealth-led Fistula Care project convened a consultative meeting in Abuja, Nigeria, to review current guidelines and practice, to discuss knowledge gaps, and to develop recommendations for standardized approaches to urinary catheterization for prevention and conservative of fistula. The rationale for the meeting was based on data from the pioneering work of Kees Waaldijk over the last two decades, which suggests that some cases of obstetric fistula presenting soon after the injury may heal without the need for surgery if the bladder is drained with a catheter (Waaldijk, 1994, 2004). It is estimated that early management with a catheter could lead to closure of the fistula in 25% of suitable cases.

The prospect of treating fistula conservatively and perhaps even preventing it by catheterization during or immediately after prolonged or obstructed labor offers a

promising alternative to surgical repair: an approach with the potential to spare women the additional trauma of surgery and to make the best use of scarce resources.

The meeting brought together a group of experienced Nigerian and international fistula surgeons, representatives of national and international professional nursing and midwifery associations, and relevant officials from the Federal Ministry of Health, as well as national and international staff from the EngenderHealth-led Fistula Care project.

The primary goal of the consultative meeting was to assist the Nigerian Ministry of Health to develop recommendations leading to national guidelines for urinary catheterization for fistula prevention and treatment and, ultimately, to national dissemination and implementation of the guidelines and later adaptation to a wider, global audience.

Conservative Management of Obstetric Fistula

Papers Waaldijk has published on his work in Nigeria show that some cases of obstetric fistulas that present soon after the injury may heal without need for surgery if the bladder is drained continuously with a catheter (Waaldijk, 1994, 1997, 2004). This important finding has the potential to allow some women to evade the need for surgical repair of their fistula.

The concept of conservative treatment for fistula with a catheter alone opens up a range of possibilities for assisting women living with fistula in low-resource environments. With appropriate management, early catheterization could lead to closure of a fistula in up to 25% of suitable cases. With guidance, this treatment could be offered by physicians without expertise in fistula repair, by midwives, nurses, or even community health extension workers (CHEWs). Therefore women could access treatment far more easily, since it could be available even at the nearest community health center.

For cases of fistula in which conservative management is unsuitable or has failed, Waaldijk's work has also challenged the long-held notion that surgical intervention for fistula should be delayed until after three months after delivery. Women may benefit from fistula repair far earlier than has been believed in the past, reducing the time that they must suffer the pain and ostracization associated with continuous leakage of urine. Since there is some early evidence that the need for social reintegration and rehabilitation is related to how long a woman must suffer with her fistula (Pope, Bangser, and Requejo, 2011), this approach of earlier intervention may reduce social and emotional morbidity.

Findings from an informal survey of fistula care providers at EngenderHealth-supported as well as non-supported sites in Nigeria conducted in advance of this meeting revealed that while fistula surgeons generally accept these principles, there is wide variation in the way that treatment is implemented. For example, very few of the providers surveyed reported the existence of written treatment protocols, the duration of catheterization for conservative treatment ranged from two to six weeks, and inclusion criteria ranged from

“small fistula only” to “any woman who is leaking.” The need for development of consensus is therefore apparent.

If conservative treatment of fistula is to be undertaken by individual providers without specific skill or training in fistula care, the need for a standardized approach is critical. Therefore, a group of experienced Nigerian and international fistula surgeons, representatives of professional organizations for midwives and nurses, relevant officials from the Federal Ministry of Health, and representatives from the Nigerian and International offices of EngenderHealth gathered to review the medical literature pertinent to this topic, discuss knowledge gaps, agree on a simplified approach for those with or without fistula surgical skills, and to strategize about the implementation of these recommendations.

Background and Definitions

As is so often the case in fistula programming, all agreed that the available clinical evidence is compelling but not consistent or complete. The literature review found very little in the way of new clinical research studies published since the original papers of Waaldijk, who was one of the expert participants at the meeting. Much of the discussion was based on Bazi’s review (2007) of published evidence, which noted considerable variability in reported success of fistula closure with catheter drainage, ranging from zero to 100%. However, based on their own experience, the fistula surgeons present agreed with Waaldijk’s original reports on the possibility that up to 25% of properly selected and managed fistula cases could close with catheter drainage alone if this therapy were instituted early enough. With estimates of new incidences of fistula at 100,000 globally (and 12,000 in Nigeria) every year, this translates into a potential for thousands of women to be treated yearly without surgery.

For the purposes of consistency, “fresh” or new fistula was defined as a case diagnosed within four weeks of the original injury. Providers agreed that after this window of time, the hope of successful conservative treatment falls progressively because of epithelialization of the fistula track. Similarly, “early” intervention, on the basis of the

previous protocol of deferring surgical repair for three months, was defined as surgical intervention undertaken *before* the end of three months following the original injury.

Consensus and Recommendations

To aid consistent implementation, the group felt it necessary to produce a treatment pathway for the conservative treatment of fistula. It is an algorithm, designed for use by doctors, nurses, and midwives or CHEWs in facilities where specialized fistula care services are not available. These facilities might range from a village health center all the way up to a specialist hospital. The only skill-set requirement is that the provider be trained and competent according to local standards in the safe insertion of a catheter for bladder drainage. The group of recommendations is quite specific and pared down to a minimum of decision-making branches.

Clinical management at facilities with fistula capabilities and without would be much the same. The only difference being that in facilities where specialized fistula services are available, the experienced fistula surgeon could exercise his/her professional judgment and, for example, opt to proceed with debridement of necrotic tissue if present or proceed with surgical repair (after performing a thorough examination of the client) at any time that conservative management no longer seemed beneficial.

Treatment Pathway: Conservative Treatment of Fistula in Settings With and Without Specialized Fistula Care Services

Entry Criteria

The treatment pathway described assumes that, first, the provider involved is skilled and approved for safe insertion of an indwelling catheter. Second, it assumes that the client is presenting within four weeks of labor for an obstetric fistula or four weeks of injury for traumatic fistula. It assumes that the approach is explained to the client, and that she gives her consent for the treatment. The client is also evaluated for other conditions requiring medical or surgical care not addressed by these recommendations.

A provisional diagnosis of fistula should be made. At facilities without specialized fistula services, diagnostic criteria would include the following (Fistula Care, 2010):

1. History

- The client must complain of the constant leakage of urine, 24 hours per day, no matter what activity she might be engaged in.
- Onset of this incontinence must have occurred directly after labor and delivery, or immediately after pelvic trauma (for example, from surgery).

2. Examination

- Examination of the client must include direct observation of urine passing from the vagina.
- Optional findings could include observation or palpation of a defect in the anterior vagina leading to the bladder or observation of urine passing from the cervical os.

The pathway does not distinguish between urinary fistula of different sizes or locations; all bladder fistula are treated the same way in this protocol. The treatment pathway will not help women with other forms of incontinence, and misdiagnosis could lead to a dangerous delay in treatment for some other medical conditions. Neither is this pathway

intended to treat rectovaginal fistula, which must be considered a separate clinical entity. Women with both rectovaginal and vesicovaginal fistula could be treated according to the bladder fistula pathway while being referred for definitive care for the rectal injury.

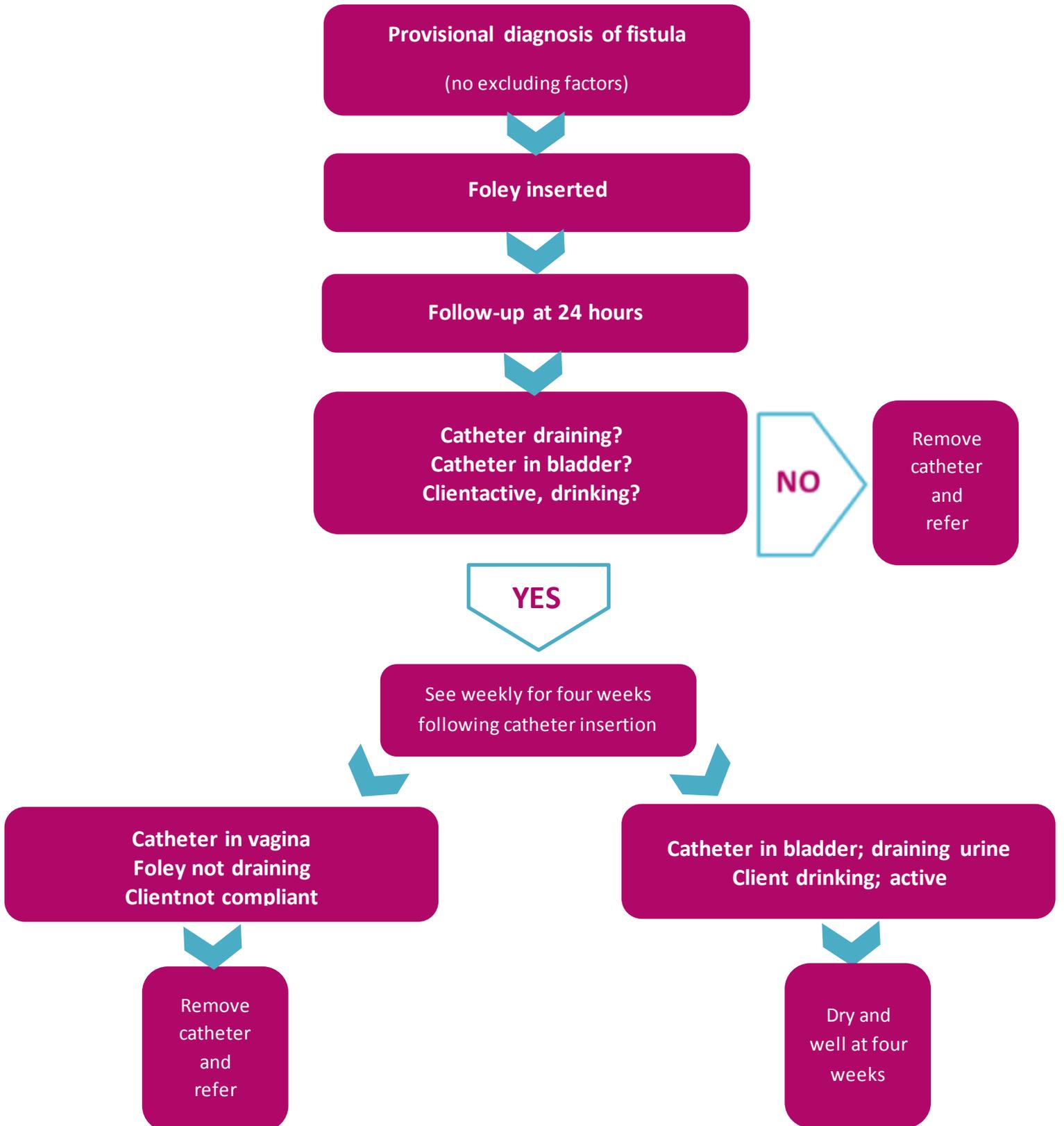
Certain clinical factors would lead to the exclusion of a client for treatment via this pathway. These include fistula resulting from pelvic malignancy, radiation therapy, or infection (such as lymphogranulomavenereum). Nor is this pathway appropriate for women suffering from incontinence after a failed attempt at fistula repair. A woman with a known fistula between the ureter and vagina would not benefit from this treatment.

While the protocol specifies that the client should begin treatment within four weeks of her labor, it should be emphasized that treatment should begin as soon as possible. If a woman is seen with a provisional diagnosis of fistula even within a day or two of labor, treatment according to the pathway should begin immediately.

For the purposes of this pathway, no other tests or treatments are required. No routine laboratory studies or any other clinical tests, including a dye test or routine medical treatments, are necessary prior to commencing treatment. Antibiotics should only be used for other concomitant medical indications; accordingly, antibiotics are omitted from this pathway. Perineal baths may be helpful but are not required. Debridement of slough should be performed only at a facility with fistula treatment capability.

Our discussion from this point will refer to Figure 1. Flow chart: Conservative treatment of obstetric fistula by urinary catheterization

Figure 1. Flow chart: Conservative treatment of obstetric fistula by urinary catheterization



Follow-up of clients after conservative treatment with urinary catheterization

Dry and well at four weeks

Foley removed

Follow up in one week
(After five weeks total)

Client is continent?

NO

Refer

YES

Before discharge from care:
Counsel client
(with partner and/or family)

- When it is safe to resume sexual relations (six months after treatment)
- Family planning options
- Stress importance of antenatal care to ensure client's health and to avoid recurrence of fistula
- Need for cesarean delivery in subsequent pregnancy
- Return in case of problems, such as UTI, recurrence of leaking

Once a woman has been diagnosed with fistula and if she does not have any of the conditions that would exclude her treatment, a catheter should be inserted using sterile technique and according to the local guidelines for catheter insertion. The catheter should be a standard Foley-type with a balloon for retention of the device in the bladder. We recommend that the balloon be inflated with 10cc of normal saline. Generally a catheter size of 16 or 18 French is ideal, but other sizes, larger or smaller, could be used if 16 or 18 French catheters are not available.

Once the catheter is inserted, a quick check should be performed to make certain that the catheter tip is within the bladder and not inside the vagina. If the catheter can only pass directly out of the bladder via the fistula and into the vagina, the client should be excluded from the pathway, the catheter removed, and the client referred for definitive therapy at a facility with the capability to treat fistula.

Once in place, the catheter should be managed with an “open-drainage” system, that is, with an open-ended tube leading from the catheter to a small pot or other receptacle.

Two important ancillary measures should be taken after catheter insertion. The first is mobilization of the client. She should be actively encouraged to ambulate and engage in as many activities of normal daily living as possible while the treatment is in effect. Inactivity leads to increased risk of pulmonary complications, metabolic compromise, orthopedic contractures, pressure sores, and many other potential problems. Secondly, the client should be encouraged to drink water. The target volume is 5 L per day (but not more). Locally this is described as “10 sachets of pure water per day.”

Review of First Steps in Treatment Pathway

The first steps in the pathway for conservative treatment of fistula are as follows:

- A provisional diagnosis of fistula of under four weeks' duration is made.
- The client is checked for exclusionary conditions (fistula from infection, radiation, or malignancy; persistent fistula after a previous attempt at repair; ureteric fistula).
- A Foley catheter is inserted.
- A quick check is made to confirm the position of the catheter within the bladder.

- A system of open catheter drainage is instituted.
- The client is carefully instructed to drink 5 L of water (and not more) per day and to remain physically active.

Twenty-four hours after the catheter is first inserted, a quick follow-up is made. Goals during this interaction include:

1. A quick check to confirm that the catheter tip is lying in the bladder, not the vagina.
2. A quick check to confirm that at least some urine is draining via the catheter.
3. Confirmation that the client understands and is complying with instructions to drink 5L of fluid per day and remain physically active.

From this point, the client is seen at weekly intervals. At each of these follow-up visits (as an inpatient or at home), the same parameters are checked:

1. Check to confirm that the catheter tip is lying in the bladder, not the vagina.
2. Check to confirm that at least some urine is draining via the catheter.
3. Confirm that the client understands and is complying with instructions to drink 5L of fluid per day and remain physically active.

These evaluations do not require repeated vaginal examinations other than to check the position of the catheter if it is not draining.

Conservative management is considered to have failed at any point during the treatment period if the catheter will not reside in the bladder and is found in the vagina, if no urine drains from the catheter, or if she is not complying with instructions to remain active and drink 5 L of fluid per day. In the case of any of these findings, the catheter should be removed and the client referred to a center with fistula treatment capability.

At the fourth weekly check—that is, four weeks after the catheter was inserted—the catheter is removed (whether the client is wet or dry). If the client is found still to be leaking urine at presentation four weeks after Foley insertion, the catheter is removed and the client is referred to a center with fistula repair capability. If she is dry with the

catheter at this four-week visit, the catheter is removed. A final follow-up visit takes place one week after the catheter is removed. If the woman is incontinent at this visit, she is referred for further management to a facility with fistula repair capability. If she is dry and continent at this visit one week after catheter removal, the fistula is considered to be successfully closed. Once again, the evidence so far is that the likelihood of the woman who is appropriately managed reaching this endpoint is up to 25%.

However, the task of the caregiver is not yet complete. It is critical that this last follow-up visit be used as an opportunity to educate the client. She should be advised that early resumption of sexual activity may be harmful to the healing area of the bladder and vagina, and that sexual activity should be deferred for six months after successful treatment of her fistula. Participants discussed this recommendation at length, and it was acknowledged that it could be challenging to the client's relationship with her partner because of prolonged sexual abstinence (Khisra and Nyamongo, 2012). The role of non-coital communication and non-penetrative sex is not well defined. The woman and her partner should be counseled on available options for family planning and child spacing, in attempt to address their reproductive intentions. Just like clients who undergo successful fistula surgery, women whose fistulas are healed via catheterization should be instructed that any subsequent baby must be delivered by elective cesarean section. Counseling for the client and her family should stress the importance of antenatal care to ensure her health and explain the need for elective cesarean section in any subsequent pregnancy. At each facility using this protocol, records should be kept to document the following:

1. The number of women receiving a catheter as immediate treatment for fistula. How many women were treated according to this protocol?
2. Of the women entering the protocol, how many were dry at the final follow-up, five weeks after the beginning of treatment? (Remembering that 100% success is not the expectation).
3. How many women exited the protocol and were successfully referred to a facility with fistula repair capability?

The same Conservative Treatment Pathway extends to settings with specialized fistula services. This could take place at a free-standing fistula center within a larger general hospital, even in a small district-level facility. The main criteria for a facility offering specialized fistula care services include:

1. A trained fistula surgeon.
2. Nurses with specific training and experience in postoperative care for fistula clients.
3. Basic consumables for fistula care.
4. Options for safe anesthesia.

Conclusions

This pathway is proposed to help standardize an approach for conservative treatment of fistula. If providers everywhere adopt these recommendations it will ensure consistency across sites, so that the true efficacy and replicability of these practices can be assessed. In this way, programs can begin to apply the concept of best-practice guidelines to this area of fistula care. As previously noted, a wide range of practices currently exists. The guidelines proposed here do not exclude other methods of managing “fresh” fistulas. Rather, the expectation is that the fistula community at large will adopt this consensus view for the sake of consistency, simplicity, and comparability of data.

There are two significant differences in clinical management between facilities with fistula repair capability and those without, as follows:

- **Initial Assessment**

It is assumed that providers at a specialized fistula facility are capable of and will provide a comprehensive diagnosis and description of the full range of pelvic injury related to untreated obstructed labor in order to exclude clients with injuries unsuitable for conservative treatment, such as ureteric fistula. In addition, while the consensus in Abuja was that catheter management could be attempted for fistula of any size, it was considered unlikely that clients with complete loss of urethra would benefit from catheter treatment alone and should probably proceed directly to surgical repair.

It is further assumed that providers at specialized fistula facilities will be competent and knowledgeable to :

- Completely and safely debride necrotic tissue
- Detect signs of local sepsis
- Assess a client's fitness for surgery when fistula repair is indicated
- Assess a client's need for pre-operative nutritional supplementation and other needs to improve wound healing

- **Post-catheterization management**

The major difference lies in post-catheterization management. In a center without fistula repair capability, the client would be managed conservatively with a catheter for up to four weeks until:

- The treatment is deemed successful because the client is continent after catheter removal and can be discharged from care, or
- The treatment is considered to have failed because the catheter is observed to be in the vagina or there is no discharge of urine via the catheter, or because the client continues to leak after catheter removal at four weeks. At this point, the client should be referred for further assessment at a specialized repair facility.

Conservative treatment at the specialized fistula repair facility is identical. The only difference is that where conservative treatment fails, the client would then proceed directly to surgical repair. As yet, there is no consensus on objective criteria to guide decisions about when to abandon conservative management and to proceed to surgical repair. They remain subjective, based on the professional judgment and experience of the fistula surgeon (an aspect that could make outcome comparisons more challenging for different facilities).

Urinary Catheterization to Prevent Obstetric Fistula

Background and Definitions

From the outset of the meeting discussions, participants acknowledged the lack of empirical evidence for the effectiveness of urinary catheterization as a preventive intervention for obstetric fistula on which to base recommendations.

The definition that was agreed on to describe the concept of urinary catheterization for fistula prevention was: catheterization performed during or immediately after prolonged or obstructed labor (whether vaginal or cesarean delivery).

Extrapolating from WHO IMPAC guidelines (WHO, 2007, 2008), as shown in Table 2, the meeting agreed on an operational definition of prolonged labor as labor lasting longer than 18 hours.

The literature search found no peer-reviewed research publications on urinary catheterization as a prevention intervention for obstetric fistula.

However, clinical guidelines and nursing/midwifery curricular training modules on management of prolonged and obstructed labor that were identified recommend immediate urinary catheterization for women who have recently experienced prolonged

Figure 2. Definition of Terms: Prolonged and Obstructed Labor

Prolonged labor: Onset of regular, rhythmical, painful contractions accompanied by cervical dilation when labor lasts longer than 24 hours. In terms of clinical management, it is useful to differentiate between *prolonged latent-phase labor* (that is, regular, painful contractions with cervical effacement and dilation up to 4 cm lasting longer than eight hours) and *prolonged active-phase labor* (regular painful contractions and progressive cervical dilation from 4 cm lasting more than 12 hours). (Adapted from WHO IMPAC guidelines: *Managing Complications in Pregnancy and Childbirth* and from the WHO midwifery education module 3: *Managing prolonged and obstructed labour* (WHO, 2007, 2008).

Obstructed labor: “failure to progress due to mechanical problems—mismatch between fetal size, or more accurately, the size of the presenting part of the fetus, and the mother’s pelvis, although some malpresentations, notably a brow presentation or a shoulder presentation, will also cause obstruction” (Neilsen, et al., 2003).

or obstructed labor (WHO, 2006, 2008; ECSA, 2012). One key text on this subject is WHO's manual *Obstetric Fistula: Guiding principles for clinical management and programme development* (WHO, 2006, Eds Lewis G and De Bernis L). This manual recommends that, in order to prevent fistula formation, or to encourage very small fistulas to close spontaneously, all women who have survived prolonged or obstructed labor should be treated immediately after vaginal or cesarean section delivery, or as soon as they present to a health care facility, with a regime of urinary catheterization for about 14 days plus a high-fluid-intake regime. It was noted that catheterization of this duration may be too long to be acceptable to women who have only potential rather than actual fistulas; counseling will play a key part. The guideline also recommends that all maternity units should draw up a protocol for the management of women who have survived prolonged labor based on these principles.

No literature was found that specifically referred to catheterization during labor, except in relation to preparation for assisted vaginal delivery or cesarean section. The added risk of infection and urethral trauma from urinary catheterization in labor are noted in the literature (Velinor, 2010). However, all guidelines that were identified stress the importance of bladder care as an integral part of care during labor and the need to void every two to four hours throughout labor, recognizing that a full bladder may hinder descent of the presenting part.

Findings from the informal pre-meeting survey indicated that providers most commonly perform catheterization after birth, on women who have endured obstructed labor or who are suffering from postpartum hematuria (the presence of blood in the urine), rather than during labor. The most frequently reported duration of catheterization was 14 days. However, given the reported lack of written protocols and the small number of providers surveyed, it is not clear how widespread the practice is in Nigeria.

Discussion around the prevention of fistula centered on the importance of skilled attendance at birth, and particularly on correct use of the partograph for diagnosis and management of prolonged or obstructed labor and bladder care during labor.

Participants focused on the need to improve the quality of intrapartum care in Nigeria

and other countries where fistula is prevalent: recognizing that delays in receiving appropriate care at health facilities contribute significantly to childbirth-related injury and death. Catheter insertion and management skills among providers at BEmONC (Basic Emergency Obstetric and Newborn Care; as distinct from Comprehensive Emergency Obstetric and Newborn Care) health facilities were considered to be particularly weak.

Recent study of the birthing accounts of women in rural Tanzania who developed obstetric fistula as an outcome of labor: delays in receiving adequate care after arrival at health facilities emerged as the most central finding in women's accounts (Mselle et al., 2011).

The group drew attention to the shortage and uneven distribution of midwives and other skilled birth attendants in Nigeria owing to the fact that the majority of health workers are located in urban areas; the group considered the potential for training CHEWs to perform urinary catheterization at BEmONC health facilities. Participants identified the need to include fistula prevention, case identification, and treatment modules and competency-based catheterization training in the pre-service education of midwives and other midwifery services providers, including nurses and CHEWs.

It was suggested that modules on these topics from the recently launched East, Central, and Southern African College of Nursing (ECSACON) and the Fistula Care curriculum for nurses and midwives, *Prevention and Management of Obstetric Fistula* (ECSA and Fistula Care, 2012), could be incorporated into the forthcoming curriculum for CHEWs in Nigeria.

Participants acknowledged the crucial contribution that professional midwives and nurses can make to preventing fistula, not only during labor and delivery but along the whole continuum of care, from community to facility level, by promoting family planning, antenatal care and institutional delivery.

More generally, the group agreed that effective strategies to prevent fistula require a broad approach. While the direct cause of the condition is prolonged or obstructed labor, the high incidence of fistula is also indirectly due to socioeconomic inequity and gender discrimination. Eradicating fistula will require strategies that engage several sectors of public health and increased long-term investment in women and girls to

improve their education and status. This will entail tackling deep-seated societal issues, such as maternal under-nutrition and early marriage and childbearing, in addition to improving the quality and coverage of maternal health services.

Recommendations

For Catheterization During and Immediately After Prolonged or Obstructed Labor

Based on meeting discussions and existing clinical guidelines, the group agreed on a provisional recommendation: to catheterize all women immediately after prolonged or obstructed labor and prior to assisted vaginal delivery or cesarean section. The recommended duration of catheterization was 14 days. During this time, it was suggested that clients could either remain as inpatients at the health facility or go home with the catheter in situ.

The recommendation for bladder management in labor was for spontaneous voiding at regular intervals (every two to four hours) without routine catheterization unless difficulties arise. It was proposed that women should be catheterized if the partograph “action line” is crossed or when the duration of labor exceeds 18 hours. For Nigeria, it was proposed that urinary catheterization during or immediately after prolonged or obstructed labor could be performed at BEmONC facilities as well as all tertiary facilities by any trained health provider who has midwifery competencies and is skilled and authorized to insert and manage a urinary catheter.

Figure 2 (at the end of this section) illustrates the suggested flow chart for urinary catheterization during or immediately following prolonged or obstructed labor, including routine bladder care during labor. Appendix 4 shows the meeting recommendations for guidelines for urinary catheterization to prevent obstetric fistula in more detail.

Provider Pre- and In-Service Education: Fistula Prevention and Treatment and Competency-Based Training in Catheter Insertion and Management

Participants recommended that fistula prevention, case identification, and treatment modules and competency-based training in catheter insertion and management be included in pre-service education of midwives and other midwifery services providers, including nurses and CHEWs.

Barriers to Implementation Identified

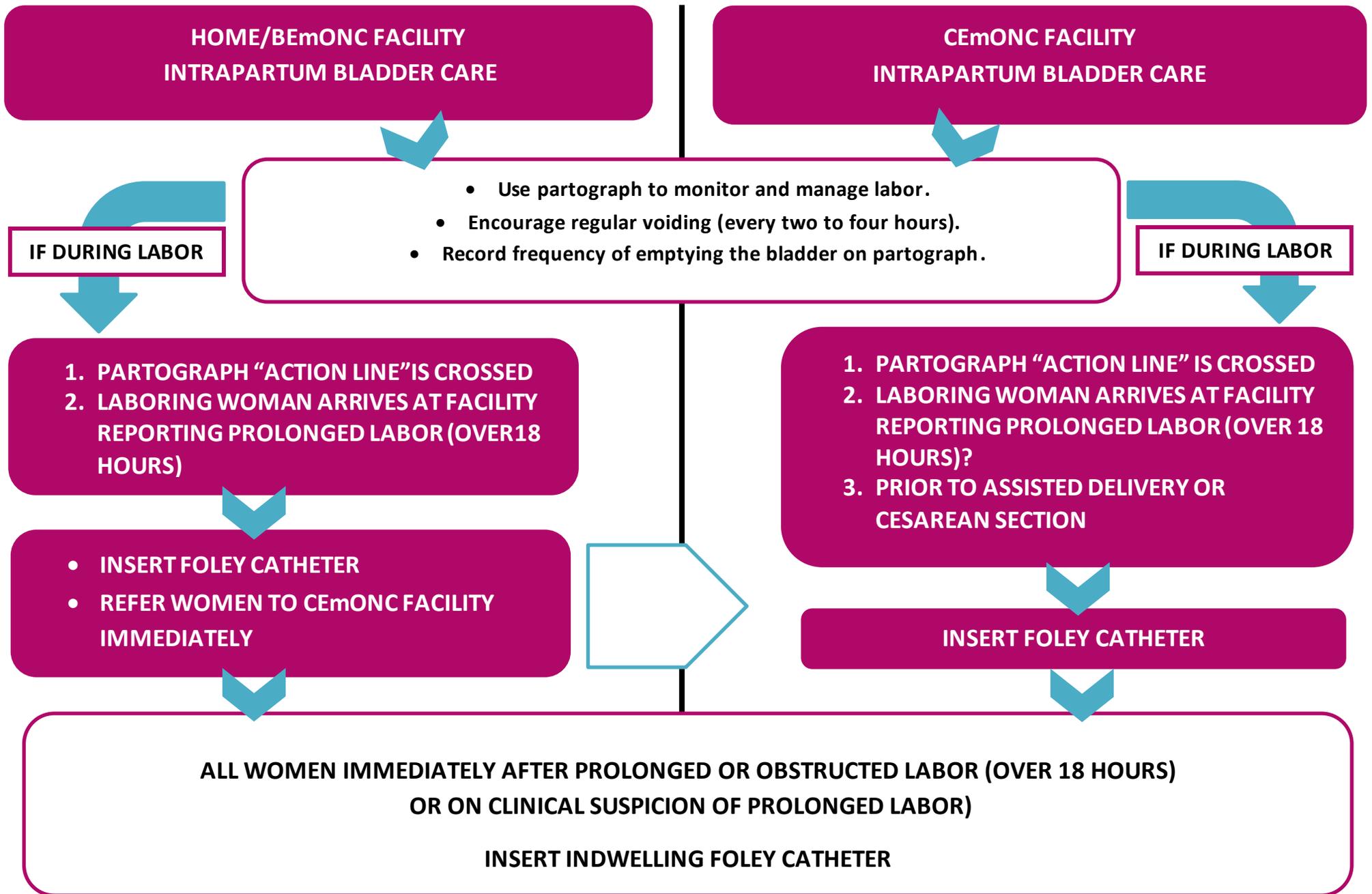
In addition to the lack of evidence, participants also identified a number of major barriers to implementing these recommendations in Nigeria and other low-resource settings:

- Health system challenges: The feasibility and effectiveness of the intervention depend on functioning emergency referral mechanisms and transportation, timely access to 24/7 CEmOC, and a sufficient number of skilled birth attendants with catheterization skills at health facilities.
- There is limited use of the partograph in most primary and secondary health care facilities.
- Many women come to health facilities late in labor or deliver at home, limiting the effectiveness of facility-based fistula prevention interventions, such as partograph use or urinary catheterization to prevent fistula.
- Client acceptability: Prolonged catheterization may not be acceptable to many women who may not understand the purpose of the intervention, or if they do not perceive that they have sustained any obvious childbirth injury. The consultative meeting agreed on the need for further discussions about the feasibility of this recommendation prior to finalizing guidelines.

Identified Future Research Needs

Participants identified the need for research to evaluate the effectiveness of urinary catheterization to prevent fistula. In addition, a knowledge, attitude, and practice (KAP) survey of community and facility-based providers would help identify potential implementation challenges and likely solutions.

Figure 3. Flow chart: Urinary catheterization to prevent obstetric fistula



Conclusion and Next Steps

The experts at the consultative meeting unanimously supported the concept of urinary catheterization for conservative treatment of obstetric fistula and reached firm consensus on the simplified approach outlined in this report.

For urinary catheterization as prevention, provisional recommendations were made, but there was more uncertainty about the evidence base. The consultative group therefore agreed on the need for further discussion prior to finalizing and putting these recommendations into guidelines for implementation.

Participants agreed that there could be challenges to implementing the recommendations for conservative treatment. First of all, it is clear that the body of literature upon which these recommendations have been made must be expanded and improved. Accordingly, it will be critically important to amass data on safety, effectiveness, costs, and logistics arising from these interventions. Monitoring and evaluation indicators from best practice will need to be developed. Because the guidelines will apply to health practitioners across a broad range of contexts, from rural clinics to major teaching hospitals, it will also be important to study the acceptability of the recommendations, and to improve them by testing them in real-life situations where on-the-ground practitioners can make practical suggestions.

Communicating and implementing the guidelines will rely to a great degree on the support of government and nongovernmental structures that support healthcare in Nigeria. Representatives from the Federal Ministry of Health were active participants in the consultation, and their continued support will be critical in the broad application of national guidelines. Professional organizations will be very important in the implementation process as well, from those that represent providers ranging from CHEWs, nurses, and midwives in countries such as Nigeria to those that comprise fistula surgeons themselves, such as the International Society of Obstetric Fistula Surgeons, the West African College of Surgeons, the Pan African Urologic Association, - respectively, ISOFS, WACS, PAUSA- and others).

In a recent commentary entitled *Maternal mortality and morbidity: A human rights imperative*(2013), the United Nations High Commissioner for Human Rights, Navenetham Pillay, asserts that “experts can develop recommendations based on available evidence but it is the responsibility of ministries of health and national government[s] to carry them out”; Pillay also points out that the adoption of a national strategy is an important first step in meeting human rights obligations. Nigeria has already taken that first critical first step by adopting a national strategy on obstetric fistula. Implementing the recommendations of this meeting will be another step on the road to meeting those obligations.

The next step after the consultative meeting will be - in collaboration with the Ministry of Health - to share the meeting report and recommendations with the national Fistula Provider Network and the Obstetric Fistula Technical Working Group. Guidelines will then be finalized, in preparation for the development of an implementation plan. Ultimately, the guidelines may provide a foundation for adaptation for wider use in collaboration with regional and global professional bodies.

Hopefully, these recommendations will play a key role in the culture of medical care that is based on best-practice guidelines and firmly founded on solid clinical evidence.

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Appendix 1

Meeting Participants

Name	Title	Organization
Mr. Abdulrafiu Alani Adeniji	President	National Association of Nigerian Nurses and Midwives (NANNM)
Dr. Steve Arrowsmith	Clinical Consultant	EngenderHealth
Dr. Olaniran Abimbola Ayodeji	Clinical Associate	EngenderHealth Nigeria
Dr. W. I. Balami, mni	D/FHD	Federal Ministry of Health, Nigeria
Dr. Justus Barageine	Obstetric Fistula Surgeon	MOH Mulano Hospital Kampala, Uganda
Ms. Karen Beattie	Project Director	EngenderHealth New York
Dr. Jemima Dennis-Antwi	Regional Adviser, Anglo Africa	International Confederation of Midwives
Ms. O. Dickson	PEO I	Federal Ministry of Health, Nigeria
Mr. Iyeme Efem	Project Manager, Nigeria	Fistula Care/EngenderHealth
Dr. Tekle G, Egiziabher	Fistula Surgeon	Rwanda Military Hospital, Kanombe
Mr. Abdullahi Haruna	CNO	Vesico Vaginal Fistula Center, Katsina
Dr. Lada Hassan Ibrahim	Vesico Vaginal Fistula Surgeon (CMO)	Federal Medical Center, Birnin Kebbi, Nigeria
Dr. Sa'ad Idris	Consultant Fistula Surgeon	Kaduna State, Nigeria
Mr. Anthonia Ike-Mbanefo	Producer	Radio Nigeria
Dr. Adamu Isah	Obstetric fistula surgeon, Chronic Disease Prevention and Management (CDPM) physician	EngenderHealth Nigeria
Mr. Kabir Lawal	CNO	Babbar Ruga Fistula Centre, Katsina, Nigeria
Dr. Sunday Lengman	Project Director	Evengel Vesico Vaginal Fistula Center BhUTH, Jos, Nigeria
Mr. Peterus Ogunmayun	AD/VV/RH	Federal Ministry of Health, Nigeria
Prof. Oladosu Akanbi Ojengbede	Professor/fistula surgeon	College of Medicine UI
Dr. Bukola Oluyide	Clinical Associate	EngenderHealth Nigeria
Dr. Gideon Osi	Workforce/Welfare Officer	Subsidy Reinvestment and Empowerment Programme, Maternal and Child Health project (SURE-P MCH), Nigeria
Ms. Rose Peter	CON/RN/RM	Bingham UTH, Jos, Nigeria
Ms. Celia Pett	Medical Associate	EngenderHealth New York
Dr. Joseph Ruminjo	Clinical Director	Fistula Care/EngenderHealth

Dr. Ileogben Sunday-Adeoye	Director	National Obstetrics Fistula Centre, Abakaliki, Nigeria
Dr. Kees Waaldjik	Immediate former President Chief Consultant Surgeon	International Society of Obstetric Fistula Surgeons (ISOFS) Babar Ruga Fistula Centre, Katsina, and Laure Fistula Centre, Kano, Nigeria

Appendix 2
Meeting Agenda

Wednesday, March 13, 2013		
Chairperson: Dr.Wapada Balami		
Time	Activity	Presenter
8:30–9:00a.m.	Registration	Ms. Ebere Diokpo Ms. Mercy Agbokhai
9:00–9:05a.m.	Opening prayer	
9:05–9:15a.m.	Introductions	
9:15–9:45a.m.	Opening remarks from representatives of: Nigerian Federal Ministry of Health USAID Nigeria Mission UNFPA EngenderHealth Nigeria EngenderHealth New York	Dr.Wapada Balami, Director Family Health Dr. Joseph Monehin, Activity Manager Mr. Iyeme Efem, COP, Fistula Care Project Ms. Karen Beattie, Fistula Care Project Director
9:45–10:15a.m.	Purpose of the meeting <ul style="list-style-type: none"> • Rationale • Objectives • Expectations • Review of the Agenda 	Dr.Joseph Ruminjo
10:15–10:30a.m.	Logistics	Mr.Iyeme Efem
Coffee break (10:30–10:50 a.m.)		
Chairperson: Dr. Sunday-Adeoye		
10:50–11:20a.m.	Overview and rationale for urinary catheterization in prolonged or obstructed labor as an effective fistula prevention strategy and as conservative treatment (including summary from literature review)	Prof. Oladosu Akanbi Ojengbede Ms. Celia Pett
EXPERIENCE FROM NIGERIA		
11:20–11:40a.m.	Results of provider network meeting catheterization survey	Dr. Adamu Isah

11:40–12:00p.m.	Experience from Jos	Dr. Sunday Lengman
12:00–12:20p.m.	Experience from Katsina	Dr.Kees Waaldijk
12:20–1:00p.m.	Discussion	
Lunch break (1:00–2:00 p.m.)		
INTERNATIONAL EXPERIENCE		
2:00–2:55p.m.	International Experience Panel <ul style="list-style-type: none"> • Rwanda • Uganda • International experience 	Dr.Tekle G. Egziabher Dr. Justus Barageine Dr. Steve Arrowsmith
2:55–3:15p.m.	Challenges, barriers, and solutions to the problem of implementing catheterization for primary prevention of fistula in prolonged or obstructed labor	Dr. Jemima Dennis-Antwi
3:15–4:00p.m.	Discussion	
4:00–4:05p.m.	Closing prayer	
4:05–5:00 p.m.	Refreshments	

Appendix 3

Literature Review: Synthesis, Citations, and Summaries by Theme

In advance of the consultative meeting, a literature search was conducted (in English and French, from 1960 onward) using MEDLINE and other search engines such as Google Scholar, with the following keywords:

- Urinary catheterization + prolonged/obstructed labor
- Catheterization + vesicovaginal fistula

Inclusion criteria comprised primary and secondary research, clinical guidelines, nursing and medical curricula, medical textbooks, and training manuals and case studies.

As is true of all fistula-related topics, the published literature on urinary catheterization is very limited.

Synthesis: Urinary Catheterization for Prevention of Fistula

No research studies were found on urinary catheterization to prevent obstetric fistula.

The clinical guidelines and nursing/midwifery curricula training modules on management of prolonged and obstructed labor that were identified recommend immediate urinary catheterization for women who have recently experienced prolonged or obstructed labor (WHO, 2006, 2008; ECSA, 2012 Eds Lewis G and de Bernis L). One key text on this subject is WHO's *Obstetric Fistula: Guiding principles for clinical management and programme development* (WHO, 2006). This guide recommends that, in order to try to prevent fistula formation, or to encourage very small fistulas to close spontaneously, all women who have survived prolonged or obstructed labor, with or without a cesarean section, be treated by routine urinary catheterization for around 14 days with a high-fluid-intake regime immediately after delivery or as soon as they present at a healthcare facility. The guide also recommends that all maternity units should draw up a protocol based on these principles for the management of women who have survived prolonged labor.

None of the guidelines found refer to catheterization during labor except in relation to preparation for assisted vaginal delivery or cesarean section. All guidelines found stress the importance of bladder care as an integral part of care in labor, the need for women to void every two to four hours during labor, and the need for providers to document frequency of voiding on the partograph.

After the meeting, a number of articles and guidelines on the topic of best practice and a range of “gray” literature (i.e. without rigorous scientific methodology) on intrapartum and postpartum bladder care and urinary catheterization, mainly from the United Kingdom, were found on the website

http://docsfiles.com/pdf_intrapartum_and_postpartum_bladder_care. Unfortunately, this literature was not available to inform meeting discussion. Although the context discussed in this literature is very different from the Nigerian context—for example, much of the discussion centers on managing the effect of epidural analgesia on intrapartum and postpartum bladder function—some of the content is relevant: All the materials found on this website focus on the importance of bladder care and of documenting frequency of voiding during labor. Several of these resources highlight the surprising lack of guidelines in relation to the frequency of childbirth-related urological problems and the need for further research in order to develop evidence-based guidelines.

A recent paper, “Urinary catheterization in labour: best practice for midwives” (Velinor, 2010), advises avoiding catheterization in labor if possible because of the added risks of infection and urethral trauma. To minimize complications, the author stresses the requirement for a clear rationale for undertaking the procedure, good working knowledge of the female genital anatomy, and skilled aseptic technique. The paper discusses the benefit of intermittent catheterization in reducing the risk of urinary tract infection. One case study (Thrumurthy et al., 2010) was found that described an iatrogenic urethro-vaginal fistula arising from catheterization in labor and hypothesized that pressure necrosis from prolonged labor in the client may have led to weakening of her posterior urethral wall, allowing the catheter to perforate it. Other “gray” literature

sources mentioned this cause of urethral fistula, but no other published obstetric literature addressing the issue was found.

Synthesis: Urinary Catheterization for Conservative Treatment of Obstetric Fistula

The main body of literature on this subject comes from the work of Dr. Kees Waaldijk in Nigeria (Waaldijk, 1995, 2004). These studies report the outcomes of early management of fistula by urinary catheterization and/or early surgical closure for a large volume of clients (more than 1700).

The other main resource found is Bazi's 2007 paper "Spontaneous closure of vesicovaginal fistulas after bladder drainage alone: review of the evidence" (2007). This review includes 30 studies undertaken between 1966 and 2007. However, only five of these address urinary catheterization (bladder drainage) as a therapeutic option alone; most combined catheterization with surgical treatment. In the five studies in which bladder drainage alone was used, the incidence of spontaneous closure of fistula ranged from 0 to 100%.

Bazi notes the following limitations of the studies reviewed:

- Most studies were retrospective, not prospective.
- The studies suffer from the lack of a detailed classification system for fistulas treated.
- The duration of catheterization treatment varies widely.

Factors influencing the success or failure of urinary catheterization as a form of treatment for fistula in the review were identified as follows:

- A long interval between causative injury and initiation of urinary catheterization treatment is associated with much lower chance of closure probably due to epithelialization of the fistula tract.
- The size of the fistula affects the chance of spontaneous closure: fistulas of less than 1cm diameter had the most favorable outcomes.
- The cause of vesicovaginal fistula, obstetric or surgical, affects the outcome.
- Duration of catheterization is an important factor.

- In evaluating any study, It is important to know how success or failure of treatment is defined. For example, does residual incontinence automatically indicate failure of treatment?
- Likewise, the length of the follow-up period is important, including the point at which success or failure is determined.

According to Bazi, the interval between injury and initiation of catheterization is the factor most closely correlated with success: the shorter, the better. However, on the basis of this review, Bazi concluded that no solid conclusions regarding recommendations for management of fistula could be drawn.

No new literature on this subject was found after 2004.

Citations and Summaries by Theme

Links are provided to all open-access sources.

Nursing and Midwifery Curricula

East, Central, and Southern Africa Health Community (ECSA-HC) and EngenderHealth/Fistula Care. 2012. The prevention and management of obstetric fistula: A curriculum for nurses and midwives. New York: EngenderHealth/Fistula Care. Retrieved from http://www.fistulacare.org/pages/pdf/Training/nursing_curriculum_2012_forweb.pdf, April 26, 2013.

A comprehensive curriculum for nurse and midwives that also covers pre- and postoperative care and skills training modules, including urinary catheterization.

World Health Organization (WHO). 2008. Midwifery education module 3: Managing prolonged and obstructed labour. (2nd ed.). Geneva. Retrieved from http://www.who.int/maternal_child_adolescent/documents/3_9241546662/en/index.html, April 26, 2013.

This module begins with a review of the anatomy and physiology relevant to the management of prolonged and obstructed labor. On the basis of this review, the module explains what makes obstructed labor more likely to occur, what happens in obstructed labor, and how signs of obstructed labor can be identified, and lists steps to be taken for effective management. Special emphasis is placed on the use of the partograph in monitoring labor. The general skills in this module include urinary catheterization.

Clinical Guidelines for Intrapartum and Postpartum Bladder Care

Canterbury District Health Board. 2012. Intrapartum and postnatal bladder care. Canterbury, United Kingdom. Retrieved from http://www.cdhb.govt.nz/cwh/maternity/mat_guide/linked_content/WCHGLM0038-Bladder%20Care.pdf, April 26, 2013.

This guide recommends that if a laboring woman has difficulty passing urine after four hours, an in/out catheter should be considered.

East Cheshire National Health Service Trust. 2012. Bladder care. (Version 5.0, March). Retrieved from <http://www.eastcheshire.nhs.uk/About-The-Trust/policies/M/Maternity%20bladder%20care%201649.pdf>, August 12, 2013.

This guide asserts a need for further research to develop evidence-based guidelines, stresses the importance of routine bladder care during labor, and recommends passing an intermittent catheter using aseptic technique if the laboring woman is unable to void after four hours or if the bladder is palpable.

National Institute of Clinical Excellence (NICE). 2006. NICE clinical guideline 37: Quick reference guide: Routine postnatal care of women and their babies. Retrieved from <http://www.nice.org.uk/nicemedia/pdf/CG37quickrefguide.pdf>, April 26, 2013.

This guide recommends that conservative measures be taken to encourage women who have been unable to void within six hours of delivery. If unsuccessful, bladder volume should be assessed and the client should be catheterized if necessary.

National Institute of Clinical Excellence (NICE). 2007. NICE clinical guideline 55: Intrapartum care: Care of healthy women and their babies during childbirth. Retrieved from <http://www.nice.org.uk/nicemedia/pdf/IPCNICEGuidance.pdf>, April 26, 2013.

These clinical guidelines on intrapartum care in the United Kingdom describe indications for and management protocols for urinary catheterization during cesarean section under regional anesthesia and epidural analgesia. No specific guidance apart from routine bladder care are offered. For the second stage of labor, the guidelines suggest that emptying the bladder may assist birth if maternal pushing is ineffective.

Royal College of Obstetricians and Gynaecologists. 2011. Green-top guideline no. 26: Operative Vaginal Delivery. Retrieved from <http://www.rcog.org.uk/womens-health/clinical-guidance/operative-vaginal-delivery-green-top-26>, April 26, 2013.

This guideline recommends that the maternal bladder should be emptied and an indwelling catheter should be removed or balloon deflated prior to operative delivery.

Velinor, A. 2010. Urinary catheterization in labour: Best practice for midwives. *British Journal of Midwifery* 18(9)(September):584–587 Abstract available at http://www.intermid.co.uk/cgi-bin/go.pl/library/article.cgi?uid=78067;article=BJM_18_9_584_587;format=pdf.

This article aims to provide a brief overview of the use of urinary catheters in the intrapartum period, including indications for and possible complications that may occur. To minimize complications, the author stresses the requirement for a clear rationale for

undertaking the procedure, good working knowledge of the female genital anatomy, and skilled aseptic technique. The article discusses the benefit of intermittent catheterization in reducing risk of urinary tract infection.

World Health Organization (WHO), Department of Reproductive Health and Research. 2000 (repr. 2007). *Integrated management of pregnancy and childbirth—Managing complications in pregnancy and childbirth: A guide for midwives and doctors*. Geneva. Retrieved from http://whqlibdoc.who.int/publications/2007/9241545879_eng.pdf, April 26, 2013.

This guide recommends urinary catheterization “if necessary” before assisted delivery and cesarean section and recommends documenting urinary output (section C48). The text includes a section on bladder care (C55-56) stating that while a urinary catheter may be required for some procedures (including cesarean section and laparotomy) early catheter removal reduces the risk of infection and encourages the catheterized woman to walk. The guide recommends retaining an indwelling catheter for a minimum of eight hours postoperatively, waiting for 48 hours in cases of uterine rupture or prolonged or obstructed labor and leaving the catheter in place for a minimum of seven days and until urine is clear if the bladder was injured (either from uterine rupture or during cesarean section or laparotomy).

Other Related Literature on Intrapartum and Postpartum Bladder Care

Carr, D., and Cook, V. Intrapartum and postnatal bladder care: A survey of midwives' current practice (abstract submitted to International Continence Survey). Retrieved from <http://www.ics.org/Abstracts/Publish/47/000255.pdf>, April 26, 2013.

A survey of current intrapartum catheterization practices among registered midwives in the United Kingdom. The authors draw attention to the limited national guidelines relating to bladder care in pregnancy and the puerperium and the wide variation in local clinical guidelines among individual obstetric units, despite the prevalence of urological problems in childbirth. The aim of this survey was to assess the scope of current practice by midwives working in a single maternity unit and to highlight possible areas of underperformance. Few midwives routinely catheterize to empty the bladder at full dilatation or remove the indwelling catheter before active pushing.

Knight, S. Intrapartum and postpartum bladder management (PowerPoint presentation). Retrieved from <http://www.ucsfcmf.com/2012/slides/MOB12003/26KnightBestBladderPracticesInLaborAndPostpartum.pdf>, April 26, 2013.

This presentation provides an overview of postpartum bladder management and complications, and a review of available guidelines.

Rahmanou, P., and Rahmanou, L. 2011. Post-partum bladder care: Background, practice, and complications. *ObsGyae and Midwifery News* (Winter). Retrieved from <http://www.ogpnews.com/article/post-partum-bladder-care-background-practice-and-complications/#&panel1-3>, April 26, 2013.

This British article on the importance of postpartum bladder care describes the varying guidelines for postpartum bladder care used in British hospitals and explains how, in the absence of a universal protocol, many urological complications are missed or mismanaged.

Zaki, M. M., Pandit, M., and Jackson, S. 2004. National survey for intrapartum and postpartum bladder care: assessing the need for guidelines. *British Journal of Obstetrics and Gynaecology* 111(8)(August):874–876. Abstract only retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/15270941>), April 26, 2013.

This report details the results of a questionnaire on current practices in intrapartum and postpartum bladder care sent to 189 maternity units in England and Wales. The survey revealed that there was no consensus of opinion about the diagnostic criteria for postpartum urinary retention and a wide variation in practice.

General Texts on Fistula Prevention and Management

Hancock, B., and Browning, A. 2009. Practical obstetric fistula surgery. Royal Society of Medicine Press. Retrieved from http://www.glowm.com/resources/glowm/pdf/POFS/POFS_full.pdf, April 26, 2013.

This guide's section on management of early cases of fistula (chapter 3) describes early treatment by catheterization after prolonged or obstructed labor following vaginal delivery or cesarean section and advocates catheterization for at least 10 days. The authors contend that up to 20 to 40% of small defects (smaller than 2 cm) may heal with bladder drainage, but that fistulae that have not healed spontaneously with four weeks of drainage are unlikely to do so.

Lewis, G., and De Bernis, L.(eds.) 2006. Obstetric Fistula: Guiding principles for clinical management and programme development. Geneva: WHO. Retrieved from http://www.who.int/reproductivehealth/publications/maternal_perinatal_health/9241593679/en/index.html, April 26, 2013.

Section 3 of this guide outlines clinical and surgical principles, including immediate management of women who have survived prolonged or obstructed labor and management of women who present immediately after delivery with fistula. In order to try to prevent fistula formation and to encourage very small fistulas to close spontaneously, the guidelines recommends that all women who have survived prolonged or obstructed labor, with or without a cesarean section, be treated by routine urinary catheterization for around 14 days together with a high-fluid-intake regime immediately after delivery or as soon as they present to a healthcare facility. The authors further recommend that all maternity units should draw up a protocol based on these principles for the management of women who have survived prolonged labor.

Wall, L.L., et al. 2005. The obstetric vesicovaginal fistula in the developing world. *Obstetrical and Gynecological Survey* 60(7 Suppl 1):S3–S51 [1404–1453]. A comprehensive overview of the epidemiology, prevention, and management of obstetric fistula. Section 6, "Early care of the fistula patient," contends that some fistulas might be prevented by prompt treatment of women who arrive at a health care facility

immediately after obstructed labor and that some fistulas might close spontaneously if the bladder is drained for a prolonged period of time.

Urinary Catheterization for Early Treatment of Fistula

Alonso Gorrea, M. et al. 1985. Spontaneous healing of uretero-vesico-vaginal fistulas. *European Urology* 11:341–343. Abstract only available at <http://europepmc.org/abstract/MED/4076274/reload=0;jsessionid=HTatM2haZtFjSr4dgn4k.2>.

A case study of the spontaneous healing of a left uretero- and vesicovaginal fistula.

Bazi, T. 2007. Spontaneous closure of vesicovaginal fistulas after bladder drainage alone: Review of the evidence. *International Urogynecology Journal and Pelvic Floor Dysfunction* 18(3)(March):329–333. doi:10.1007/s00192-006-0194-7.

A review of published evidence (30 articles) from 1996 to 2007, including five articles on the treatment of fistula with bladder drainage alone. The studies reviewed suffer from the following limitations: most were retrospective, not prospective; there is no consistent classification system for the fistulas treated; and there is much variation in the duration of catheterization treatment. The interval between injury and initiation of catheterization is the factor most closely correlated with success (the shorter, the better); a long interval is associated with a much lower chance of closure, probably because of epithelialization of tissue. Other factors influencing the success of treatment include the size of the fistula (less than 1 cm is most favorable), the cause of the VVF (obstetric or iatrogenic), the duration of catheterization, the definition of success or failure of treatment, and the length of the follow-up period (the point at which success or failure is determined). The author concludes that no solid conclusions regarding management recommendations can be drawn, because of methodological variations in the studies.

Davits, R. J. A. M., and Miranda, S. I. 1991. Conservative treatment of vesicovaginal fistulas by bladder drainage alone. *British Journal of Urology* 68(2)(August):155–156. Doi:10.1111/j.1464-410X.1991.tb15285.x.

A description of four cases of conservative management of vesicovaginal fistulas occurring as a complication of abdominal and vaginal hysterectomy in the Netherlands. In all cases treatment involved simple bladder drainage for periods ranging from 19 to 54 days. At follow-up all clients remained dry.

Falk, H. C., and Tancer, M.L. 1969. Urethrovesicovaginal Fistula. *Obstetrics and Gynecology* 33(3)(March):422–431.

This paper describing treatment options for fistula due to various causes (obstetric or surgical injury, radiation) in the United States reports spontaneous healing of some fistulas with early treatment by urinary catheterization.

Harrow, B.R. 1969. Conservative and surgical management of bladder injuries following pelvic operations. *Obstetrics and Gynecology* 33(6):852–855.

This paper proposes, based on clinical experience, that many vesicovaginal fistulas resulting from gynecological operations could be cured by urinary catheterization alone. Nine of 21 clients studied healed spontaneously. The main principle of the treatment is to prevent any bladder distension until firm healing of the fistula's edges takes place.

Ramaiah, K. S., and Kumar, S. 1998. Vesicovaginal fistula following masturbation managed conservatively. *Australian and New Zealand Journal of Obstetrics and Gynaecology*38(4)(November):475–476.doi:10.1111/j.1479-828X.1998.tb03118.x. A case study of urethral fistula successfully treated with 14 days of urinary catheterization.

Waaldijk, K. 1994. The immediate surgical management of fresh obstetric fistulas with catheter and/or early closure. *International Journal of Gynecology and Obstetrics*45(1)(April):1–16.

This prospective study considers 170 clients with an obstetric fistula of less than three months' duration treated by catheterization and/or early surgical closure. The fistula was closed in 156 cases (91.8%). The author asserts that insertion of an indwelling bladder catheter promoted the spontaneous healing of the smaller fistulas (those up to 2 cm diameter in size) in some 50 to 60% of these clients.

Waaldijk, K. 2004. The immediate management of fresh obstetric fistulas. *American Journal of Obstetrics and Gynecology*191(3)(September):795–799.Retrieved from http://www.isofs.org/wp-content/uploads/2011/01/immediate_mgt_waaldijk.pdf, August 12, 2013.

A prospective study of 1,716 clients with an obstetric fistula of duration from three to 75 days after delivery who received immediate treatment on presentation by catheter and/or early closure. Instead of antibiotics, a high-oral-fluid regimen was instituted. Upon initial treatment, 1,633 fistulas (95.2%) were successfully closed, with another 57 closed after subsequent treatment, yielding final closure in 1,690 clients (98.5%); 264 clients (15.4%) were healed by bladder drainage alone.

Other Related Literature

Arrowsmith, S. D., Ruminjo, J., and Landry, E. G. 2010. Current practices in treatment of female genital fistula: A cross sectional study. *BMC Pregnancy and Childbirth* 10:73. Retrieved from <http://www.biomedcentral.com/1471-2393/10/73>, April 26, 2013.

The primary objective of this study is to identify issues in fistula care that would benefit from clinical trials because they have significant implications in terms of costs, time, efficiency, or outcome. The survey provides a snapshot of current fistula practice across a wide swath of geographic, economic, and organizational conditions. The results point out surprising degrees of consensus in some areas while highlighting the tremendous disparity of practices in others. Treatment of small, new fistulas by catheter drainage is identified as an issue that would benefit from a clinical trial to help identify best practice.

Creanga, A.A., et al. 2007. Prevention and treatment of obstetric fistula: Identifying research needs and public health priorities. *International Journal of Gynecology and Obstetrics* 99 Suppl 1: S151–154.

This article reports conclusions of a consultative meeting to discuss the extent of the problem of obstetric fistula and the best ways to address it. Among the research priorities identified is the need to identify evidence-based practices for successful fistula management, including the duration of post repair catheterization, and to assess low-cost methods of treating fistula in resource-constrained settings.

International Confederation of Midwives. 2011. Prevention of obstetric fistula. Position statement adopted at the Durban International Council meeting, 2011. Retrieved from http://www.internationalmidwives.org/assets/uploads/documents/Position%20Statements%20-%20English/PS2011_014%20ENG%20Obstetric%20Fistula.pdf, April 26, 2013.

The position statement provides an overview of obstetric fistula and stresses the importance of skilled midwifery care to efforts to eliminate fistula. It urges professional midwifery associations to contribute to the development and dissemination of national policies and protocols of practice that prevent obstetric fistula and to ensure that midwifery education includes modules aimed at prevention and clinical screening for obstetric fistula.

Kelly, J. 1994. Current methods of urinary fistulae repair. *Current Obstetrics and Gynaecology* 4: 104–106.

This overview of fistula repair procedures recommends waiting two to three months before surgical repair because “some small fistulae will heal spontaneously, usually with the aid of catheter drainage.”

Kongnyuy, E. J., Mlava, G., and van den Broek, N. 2008. Establishing standards for obstructed labour in a low-income country. *Rural and Remote Health* 8: 1022. Retrieved from <http://www.rrh.org.au/articles/showarticlenew.asp?ArticleID=1022>, April 26, 2013.

This study considers the feasibility of involving health professionals at all levels in the establishment of standards for obstructed labor in Malawi, using evidence from Malawi national guidelines, WHO manuals, and peer-reviewed journals. Proposed standards for proper management of prolonged and obstructed labour include urinary catheterization.

Mselle, L.T., et al. 2011. Waiting for attention and care: Birthing accounts of women in rural Tanzania who developed obstetric fistula as an outcome of labour. *BMC Pregnancy and Childbirth* 11: 75. Retrieved from <http://www.biomedcentral.com/1471-2393/11/75>, April 26, 2013; doi:10.1186/1471-2393-11-75.

This mixed-methods study explores the birthing experiences of women affected by fistula and *the barriers to accessing adequate care during labor and delivery, revealing major gaps in access to and provision of emergency obstetric care and illustrating how poor quality of care at health facilities contributes to delays that lead to severe birth injuries. After arrival at a health facility, women in the study experienced lack of supportive care, neglect, poor assessment of labor, and lack of supervision.*

Thrumurthy, S. G., Hill, S. R., and Islam, S. 2010. Iatrogenic urethrovaginal fistula from catheterization in labour. *British Journal of Hospital Medicine* 71(7)(July):414.
A case study of a primigravida who developed a urethral fistula after catheterization in the second stage of labor with a standard semirigid Lofric catheter.

Appendix 4

Recommendations for Guidelines for Urinary Catheterization to Prevent Obstetric Fistula

Inclusion criteria	<ul style="list-style-type: none"> Client has assisted delivery or cesarean section. Labor lasts over 18 hours or the partograph “action line” is crossed. Client presents immediately after prolonged or obstructed labor. 	
Exclusion criteria	<ul style="list-style-type: none"> After appropriate counseling, client refuses treatment Bladder carcinoma (very rare) 	
Responsibility for catheterization insertion and management	Insertion, management, assessment of progress and removal may be performed in the community (including at home), first-level facility, or CEmONC facility by any trained provider, clinically competent and authorized: <ul style="list-style-type: none"> To conduct deliveries To insert a urinary catheter 	
	HOME/BEemONC FACILITY	CEmONC FACILITY
Suggested management protocol	<ul style="list-style-type: none"> Use partograph to monitor labor. Encourage regular voiding (every two hours). Record frequency of emptying the bladder on partograph. Have competent provider insert Foley catheter (size 16–18) at home or first-level health facility prior to emergency referral. Detect prolonged or obstructed labor early and refer to CEmONC facility. 	<ul style="list-style-type: none"> Use partograph to monitor labor. Encourage regular voiding (every two hours). Record frequency of emptying the bladder on partograph. Insert Foley catheter prior to assisted delivery/CS. Follow protocol immediately after delivery for all women experiencing prolonged or obstructed labor.
Observations while catheter is in situ	The following observations should be made every four hours for 24 hours post natally and then daily: <ul style="list-style-type: none"> Haematuria Cloudy or purulent urine Urine output 	
Ancillary treatment	<ul style="list-style-type: none"> Antibiotics only if clinically indicated for infection High fluid intake regime: 5–6 L per day 	
Prior to catheter removal	<ul style="list-style-type: none"> Perform pelvic examination. Retain catheter if there is clinical suspicion of fistula and refer to facility with fistula expertise. 	
Predischarge counseling	<ul style="list-style-type: none"> Counsel client to return immediately to facility in case of leaking urine. Provide family planning counseling, including information on contraception and birth spacing. 	
Follow-up	Fit into postnatal visit schedule based on national policy.	
Recommended program indicators	<ul style="list-style-type: none"> Availability of protocol at all facilities Number of providers trained and competent in partograph use and catheter insertion and management Number of women in prolonged or obstructed labor who were catheterized according to protocol compared to number of women admitted with prolonged or obstructed labor Establishment of routine clinical audit process at all facilities for women who have experienced prolonged or obstructed labor and frequency of clinical audit 	
Implementation challenges	<ul style="list-style-type: none"> Many women come late in labor, limiting effectiveness of facility-based labor monitoring and decision making. Major systems challenges to implementation include sufficient skilled staff, resources, logistics, bed space, and supplies. 	