

# An Audit of Clinician Compliance with Best Practice Recommendations to Repair Severe Obstetric Anal Sphincter Injuries

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## Abstract

**Context:** Obstetric anal sphincter injuries occur uncommonly in Caribbean practice but are accompanied by substantial morbidity.

**Objective:** To evaluate clinicians' compliance with management guidelines at a national referral hospital in Jamaica.

**Design:** Retrospective review of the records of all consecutive obstetric patients with anal sphincter injuries between November 1, 2007, and December 30, 2012.

**Main Outcome Measures:** The primary end point was the completion of each of 8 tasks from existing management guidelines: 1) interdisciplinary consultation, 2) perineal examination with the patient under anesthesia, 3) injury repair in the operating room, 4) prophylactic antibiotics at induction, 5) repair by an experienced clinician, 6) repair method appropriate for injury grade, 7) slowly absorbable suture chosen for sphincter repair, and 8) rapidly absorbable suture for mucosal repair. We quantified clinician compliance with the guidelines by assigning a score of 1 for each task completed and 0 for an incomplete task. Individual task scores were summed. Clinicians were considered compliant when their overall score was above 6.

**Results:** Twenty-six women (mean age = 27 years; standard deviation = 5.78 years) had obstetric anal sphincter injuries. Nine cases (34.6%) earned clinician compliance scores above 6, and 17 (65.4%) had scores of 6 or below. Experienced clinicians repaired all the injuries in this study—the only task for which compliance was 100%.

**Conclusion:** Despite attempts at improving therapeutic outcomes by creating tailored guidelines for repair of obstetric anal sphincter injuries, there is a serious barrier to success because 65% of senior clinicians were noncompliant.

## Introduction

In Caribbean practice, obstetric anal sphincter injuries occur after 0.2%<sup>1</sup> to 0.3%<sup>2</sup> of vaginal deliveries. This is lower than the 0.5%<sup>3,4</sup> to 6%<sup>5</sup> incidence in non-Caribbean populations, but the therapeutic outcomes in this setting are poor. An audit at the national referral hospital in Jamaica revealed

that women experienced high overall morbidity (43%) and fecal incontinence (23%) after operative repair of obstetric anal sphincter injuries.<sup>1</sup> The study uncovered several deviations from best practice and prompted corrective measures in an attempt to improve therapeutic outcomes. These measures included educational campaigns,<sup>6</sup> development of local practice guidelines,<sup>2,6,7</sup> and the implementation of clinical care pathways at the facility (Figure 1).<sup>8</sup>

It is reasonable to expect improved outcomes with these corrective measures, but the caveat is that clinicians must adhere to the practice guidelines. If clinicians were noncompliant, it would be unreasonable to expect a reduction in morbidity. Therefore, we carried out an audit to document clinicians' compliance with these institutional guidelines five years after they were introduced in 2007.<sup>8</sup> We did not set out to evaluate the evidence supporting the practice guidelines. Instead, our aim was to evaluate clinicians' compliance with the existing guidelines, which has been shown to be an independent predictor of guideline success.<sup>9</sup>

## Methods

This study was performed at the Obstetric Department of the University Hospital of the West Indies. This is 1 of 2 tertiary referral hospitals that serve an estimated catchment population of 826,880 persons in and around Kingston, the capital of Jamaica.<sup>10</sup> This hospital facilitates 1696 vaginal deliveries each year.<sup>1</sup>

The new practice guidelines were introduced at this institution in 2007<sup>8</sup> and rolled out in four stages. First, local outcomes data were presented at institutional grand rounds, and the guidelines were presented to the target clinician population. Clinicians were also targeted by posted signage in and around the labor and delivery rooms. In the third stage, guidelines were presented and discussed at national clinical conferences. Finally, the guidelines were published in the regional medical literature, whose readership included clinicians at the host institution.

The primary aim of this study was to evaluate clinician compliance to practice guidelines 5 years after they were introduced.

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Therefore, the local institutional review board granted permission to access the records of all patients who had vaginal deliveries between November 1, 2007, and December 30, 2012. All women who sustained anal sphincter injuries in an obstetric setting were identified by manually reviewing the delivery logs maintained by the labor ward. In an attempt to reduce selection bias and ensure inclusion of all study subjects, a search of medical discharge codes for obstetric anal sphincter injury was also performed in a database maintained by the Medical Records Department. This was a convenience sample including all women with obstetric anal sphincter injuries.

The hospital records of women who sustained obstetric anal sphincter injuries were retrieved, and data were extracted retrospectively. The clinical outcomes in this study could not be blinded, but in an attempt to reduce data extraction bias, we recruited multiple, independent data collectors to review patient files. The data collectors also attempted to reduce inter-rater variability of the grade of obstetric anal sphincter injury by cross-referencing surgeon-assigned grades with documented findings in the operative notes. Any missing data from patient records were excluded from the analysis.

The practice guidelines documented eight concrete tasks for clinicians to complete when managing obstetric anal sphincter injuries. Therefore, the primary study end points were to document the completion of these tasks: 1) interdisciplinary consultation requested, 2) perineal examination performed with the patient under anesthesia, 3) injury repaired in the

operating room, 4) a single dose of prophylactic second- or third-generation cephalosporin administered intravenously at induction of anesthesia, 5) repair performed by an experienced clinician, 6) recommended repair method appropriate for the injury grade, 7) recommended suture chosen for sphincter repair, and 8) recommended suture chosen for mucosal repair. The completion of each task was considered compliance with the practice guideline.

We sought to quantify compliance by assigning a score of 1 for each completed task and 0 for an incomplete task. The individual task scores were summed to arrive at an overall compliance score that could range from 0 to 8.

Although a score of 8 (100% compliance with all tasks) would be ideal, we thought this would be an unrealistic finding. Therefore, we attempted to define a threshold score below which compliance would be unacceptable. As there were no existing standards, 7 senior authors participated in a consensus meeting to define a clinically relevant value for an unacceptable score. It was agreed that this would be determined by administering a blinded questionnaire to 5 attending surgeons and obstetricians outside the study population. Their responses were similarly graded. The mean overall compliance score for the 5 experts (6.8; SD = 1.30) was used to define a value for an unacceptable compliance score. On the basis of this mean score, we defined 2 groups of clinicians: compliant clinicians had an overall compliance score above 6, and noncompliant clinicians had scores of 6 or below.

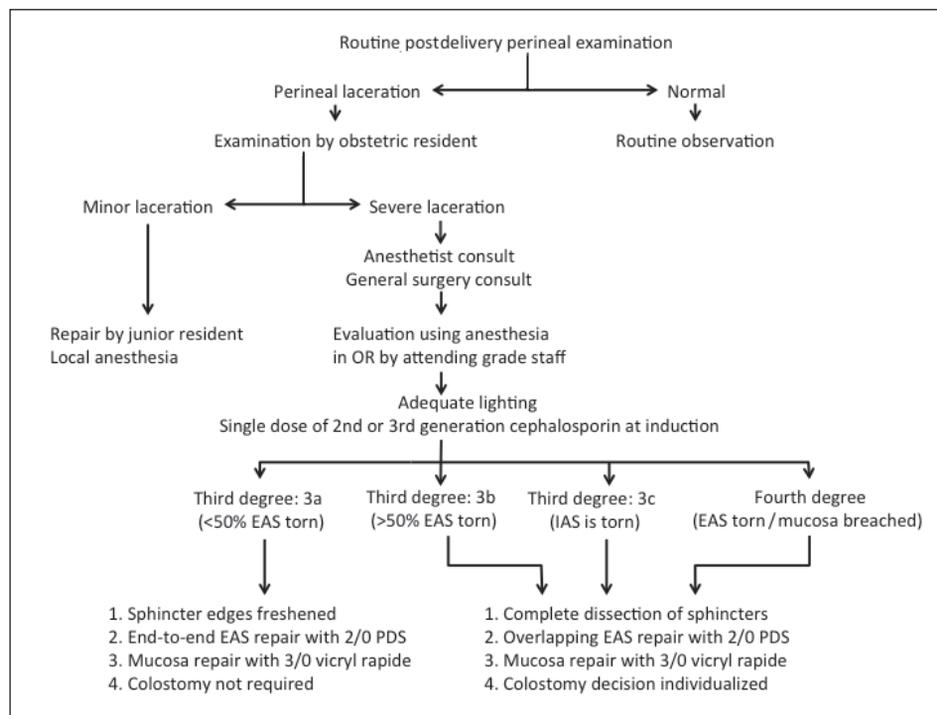


Figure 1. Clinical care pathways for management of obstetric perineal lacerations at the University Hospital of the West Indies in Jamaica.

EAS = external anal sphincter; IAS = internal anal sphincter; OR = operating room; PDS = polydioxanone suture.

The Statistical Package for Social Sciences (SPSS) version 12.0 (IBM SPSS, Chicago, IL) was used for data analysis. Descriptive statistics were generated as appropriate.

## Results

There were 8108 vaginal deliveries over the 62-month study period. Twenty-six women (0.32%) with a mean age of 27 years (SD = 5.78 years; range = 17-38 years) sustained obstetric anal sphincter injuries. Of these 26 injuries, 23 (88.5%) were third-degree (8 Grade 3a injuries, 10 Grade 3b injuries, and 5 Grade 3c injuries), and 3 (11.5%) were fourth-degree obstetric anal sphincter injuries. All hospital records were recovered for patients with obstetric anal sphincter injury.

The guidelines called for interdisciplinary consultation and perineal examination of the patient under anesthesia to be performed. This would be followed by appropriate repair by attending staff in the operating room. In this study, a request for interdisciplinary consult was made in 8 cases (30.8%). Only 10 patients (38.5%) underwent an examination under anesthesia (7 under general and 3 under regional anesthesia), and they went on to have repair in the operating room. The remaining repairs were performed in patients on delivery beds in the labor wards.

Although antibiotics were always administered, the recommended regimen was used in only 2 cases. In the remaining 24 cases, different agents were chosen and/or administered for longer than 72 hours' duration. Therefore, the recommendations for antibiotic therapy were observed in only 2 (7.7%) of the cases.

In all cases, the injuries were repaired by experienced clinicians: attending clinicians (n = 11) and resident physicians in their final year of postgraduate training (n = 15). Regardless of the method of repair, the guidelines required the use of nonabsorbable or slowly absorbable sutures. In this series, the sphincter was reconstructed with nonabsorbable polypropylene (Prolene) sutures in only 8 cases (30.8%) and with rapidly absorbing polyglactin sutures (Vicryl Rapide) in the remainder.

The guidelines stratified the repair method according to the injury grade. In 5 cases, the method of repair was not recorded. There were 18 patients with Grade 3a or 3b obstetric anal sphincter injuries who should have been treated preferentially with end-to-end (approximation) repair according to the existing guidelines. In this group, there were 13 end-to-end repairs, 3 overlapping repairs, and 2 unspecified repairs performed. Eight patients had Grade 3c or 4 injuries and should have been treated preferentially by sphincter mobilization and overlapping repair. In this group, overlapping repair was performed in 5 patients and unspecified repairs in 3 patients. Therefore, there was adherence to the guidelines for repair method in 18 cases (69.2%). To complete the repair, absorbable sutures (2-0 or 3-0 Vicryl) were selected for closure of the mucosa in 24 cases (92.3%).

According to overall compliance scores, 9 cases (34.6%) earned compliance scores above 6 (compliant). There were 17 cases (65.4%) with scores of 6 or less (noncompliant).

## Discussion

In the Caribbean, obstetric anal sphincter injuries are uncommon injuries, which occur in 0.2%<sup>1</sup> to 0.3%<sup>2</sup> of vaginal deliveries. Therefore, the average clinician would be relatively inexperienced in the management of these complex injuries. Furthermore, these injuries occur unpredictably and are often diagnosed and managed by junior obstetric staff on an emergent basis.<sup>1</sup> This is exactly the reason that practice guidelines were developed: to guide clinicians who are faced with an uncommon clinical problem through its management, encouraging them to adhere to the principles of best practice. Therefore, learning that 65% of clinicians are noncompliant with existing guidelines is disappointing, especially in light of the poor therapeutic outcomes documented in this setting.<sup>1-4,6,7</sup>

There was a single guideline for which compliance was 100%: experienced clinicians performed all the repairs in this study. Although it was encouraging to see that experienced clinicians performed repair in keeping with the guidelines, it was also concerning because it meant that the senior clinicians were the ones who were noncompliant with the other guidelines. We cannot expect junior staff members to be compliant when their mentors are not.

The task with the worst compliance record related to antibiotic use, despite the local guidelines mirroring existing recommendations in medical literature for prophylaxis against wound infections in obstetric anal sphincter injuries.<sup>11,12</sup> The poor compliance was not limited to this setting, however. Schimpf et al<sup>12</sup> reported the antibiotic prescribing practice of clinicians surveyed at the 2011 Annual Scientific Meeting of the Society of Gynecologic Surgeons. They uncovered substantial variability in practices, with 30% of respondents having practices inconsistent with recommendations from the American College of Obstetricians and Gynecologists.<sup>12</sup> The respondents reported that hospital policy affected their choice of antibiotic prophylaxis 15% of the time.<sup>12</sup> Admittedly, there is little evidence supporting this guideline. A Cochrane review attempted to evaluate the role of antibiotic prophylaxis in severe perineal tears after vaginal birth but returned no randomized controlled trials evaluating the outcomes with or without antibiotics.<sup>13</sup> Despite the paucity of evidence, most authorities do recommend antibiotic prophylaxis in patients with severe obstetric anal sphincter injuries.<sup>11,12</sup> However, these recommendations are supported only by expert committee opinions and the experience of respected authorities (Level IV evidence). The absence of strong evidence for this recommendation may have produced a lack of confidence in the local guidelines, hence contributing to the clinicians' noncompliance.

This study has uncovered a failure in clinician compliance with all tasks except repair by experienced clinicians. There are several potential reasons for this. First, for clinicians to be compliant, they must be aware of the guidelines. Although there were four phases of guideline introduction, all focusing on different ways to target the clinicians, there could have

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also been in-service training for clinicians caring for patients on the labor and delivery wards. Policy introduction to make certification of training mandatory for these clinicians would have also strengthened compliance. These are useful learning points to improve future guideline rollout and to increase compliance with current ones.

Policy makers should also try to identify the barriers to compliance and address them. This must be approached in a manner tailored to the Caribbean context since there are several unique cultural, financial, and environmental factors that influence compliance differently from that in developed countries.<sup>14</sup> We describe some of them here.

### Health Care Funding

The health care sector in Jamaica is underfunded, with only 4% of the national budget being allocated to health.<sup>14</sup> This translates to a chronic shortage of drugs, sutures, and surgical disposable supplies.<sup>14</sup> Often, clinicians must improvise to deliver care and may not be able to comply with the guidelines when the required supplies (recommended sutures, for example) are unavailable. Additionally, without a consistent supply of anesthetic drugs, ventilators, monitors, and/or staff, access to the operating room is not always available.<sup>14</sup> Therefore, clinicians may opt to forgo examination using anesthesia and/or perform repairs while the patient is on the delivery bed, without proper lighting and instrumentation.

Although much good work is performed in Jamaican health care facilities, it is no secret that the health care workers are expected to provide patient care in extreme circumstances. However, simple maneuvers may improve compliance. For example, the procurement process should be prioritized to ensure that the requisite supplies are readily available for clinicians to use. Another maneuver is to seek partnerships with health care facilities in developed countries that may donate supplies or provide them at nominal cost.

### Surveillance and Enforcement

An integral part of quality service delivery is surveillance of clinical practices. In Jamaica, this has traditionally been achieved through strong leadership from senior clinicians because the use of technologic aides would not be financially feasible. This is not ideal in this instance because the senior clinicians are noncompliant with clinical guidelines. Disciplinary action may not be required for accountability. The simple knowledge that there is active monitoring might be sufficient to bring about behavioral modification without the threat of sanctions.<sup>15</sup> This could be achieved by training a small team to carry out clinical audits and by providing them with the necessary hardware, software, and support staff for surveillance and reporting.

### Training in Operating Room Best Practice

We recognize that knowledge improvement alone does not necessarily translate to sustained improvement in compliance.<sup>16</sup> However, without knowledge of best practice principles for repair of obstetric anal sphincter injuries, clinicians may not appreciate the need to comply with guidelines. The

fact that there was poor compliance suggests that our facility's attempts at imparting knowledge during guideline introduction were not successful. It is interesting that these findings mirror those from compliance studies conducted in developed nations, where there is wide variation in compliance to existing practice guidelines.<sup>17,18</sup> Despite the abundance of supplies and better monitoring that exists in developed countries, there are still only incremental improvements in performance,<sup>19-21</sup> suggesting that this is a complex, multifactorial problem. Perhaps alternate methods of training are needed, such as dedicated workshops and in-service training sessions.

### Study Limitations

There are several limitations to our study. Although it is ideal to have 100% compliance with existing guidelines, this is not a realistic expectation because there are no reports of 100% compliance in the medical literature. Nevertheless, we acknowledge that the method of defining compliance may introduce a degree of bias. It is difficult to determine the degree of noncompliance that is tolerable in clinical practice.

This study was carried out using a convenience sample. The resultant study population is small, and this makes statistical relationships difficult to appreciate. However, the incidence of obstetric anal sphincter injury is generally low in most series, so it would be difficult to accrue large numbers of patients with this clinical problem.

The issue of selection bias in identifying study participants has already been discussed. In an attempt to overcome this, we employed cross-referencing between the codified discharge records and labor ward registries. However, we acknowledge that there may still be potential selection bias because we may not have been able to identify all patients using this method.

Data source cross-referencing was also used to minimize bias from interrater variability in the assessment of severity of obstetric anal sphincter injury that may have been introduced through data extraction by chart review. However, we do acknowledge that there may still be potential bias with this method.

Potential bias may have arisen from the data collection personnel not being blinded to therapeutic outcomes. We attempted to overcome this by having several persons collecting data from medical charts, but acknowledge that this would not completely eliminate bias from the study design.

Finally, a presumption was made that the lack of documentation meant that a task was incomplete. Again, data cross-referencing was used to strengthen this, but we acknowledge that this remains a potential limitation of the study design.

### Conclusion

Despite attempts at improving therapeutic outcomes by creating tailored guidelines for repair of obstetric anal sphincter injury, there is a serious barrier to success because 65% of senior clinicians are noncompliant with existing clinical guidelines for the management of this type of injury. Policy makers must address this problem if there is a genuine desire to improve therapeutic outcomes after repair of these anal sphincter injuries. ❖

**Disclosure Statement**

The author(s) have no conflicts of interest to disclose.

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**References**

- Cawich SO, Mitchell DI, Martin A, et al. Management of obstetric anal sphincter injuries at the University Hospital of the West Indies. *West Ind Med J* 2008 Nov;57(5):482-5.
- Lewis T, DaCosta V, Harriott J, Wynter S, Christie L, Cawich SO. Factors related to obstetric third and fourth degree perineal lacerations in a Jamaican cohort. *West Ind Med J* 2011 Mar;60(2):195-8.
- Sultan AH, Kamm MA, Hudson CN, Bartram CI. Third degree obstetric anal sphincter tears: risk factors and outcome of primary repair. *BMJ* 1994 Apr 2;308(6933):887-91. DOI: <http://dx.doi.org/10.1136/bmj.308.6933.887>.
- Tetzschner T, Sørensen M, Lose G, Christiansen J. Anal and urinary incontinence in women with obstetric anal sphincter rupture. *Br J Obstet Gynaecol* 1996 Oct;103(10):1034-40. DOI: <http://dx.doi.org/10.1111/j.1471-0528.1996.tb09557.x>.
- Carroll TG, Engelken M, Mosier MC, Nazir N. Epidural analgesia and severe perineal laceration in a community-based obstetric practice. *J Am Board Fam Pract* 2003 Jan-Feb;16(1):1-6. DOI: <http://dx.doi.org/10.3122/jabfm.16.1.1>.
- Cawich S, Bambury I, Mitchell D, Plummer J, Williams E. Colostomy for a fourth degree perineal laceration: where is the evidence? *The Internet Journal of Gynecology and Obstetrics* [Internet] 2007 [cited 2014 Apr 21];8(2):[about 3 p]. Available from: <http://ispub.com/IJGO/8/2/13327#>.
- Cawich S, Bambury I, Mitchell D, Plummer J, Newnham M, Christie L. Is a diverting colostomy required after repair of obstetric ano-rectal injuries? *The Internet Journal of Third World Medicine* [Internet] 2008 [cited 2014 Apr 21];6(2):[about 4 p]. Available from: <http://ispub.com/IJTW/6/2/9170>.
- Cawich SO, Mitchell DI, Martin A, et al. Can we improve therapeutic outcomes after obstetric anal sphincter injury at the University Hospital in Jamaica? [Abstract]. *West Ind Med J*. 2007;56(51):53.
- Javors JR, Bramble JE. Uncontrolled chronic disease: patient non-compliance or clinical mismanagement? *Dis Manag* 2003 Fall;6(3):169-78. DOI: <http://dx.doi.org/10.1089/10935070332242518>.
- Cawich SO, Harding HE, Crandon IW, et al. Leadership in surgery for public sector hospitals in Jamaica: strategies in the operating room. *Perm J* 2013 Summer;17(3):121-5. DOI: <http://dx.doi.org/10.7812/TPP/12-117>.
- Fernando RJ, Williams AA, Adams EJ. The management of third- and fourth-degree perineal tears. Green-top guideline no. 29 [Internet]. London, United Kingdom: Royal College of Obstetricians and Gynaecologists; 2007 Mar [cited 2014 Apr 8]. Available from: [www.rcog.org.uk/files/rcog-corp/GTG2911022011.pdf](http://www.rcog.org.uk/files/rcog-corp/GTG2911022011.pdf).
- Schimpf MO, Morill MY, Margulies RU, Ward RM, Carberry CL, Sung VW. Surgeon practice patterns for antibiotic prophylaxis in gynecologic surgery. *Female Pelvic Med Reconstr Surg* 2012 Sep-Oct;18(5):281-5. DOI: <http://dx.doi.org/10.1097/SPV.0b013e31826446ba>.
- Buppasiri P, Lumbiganon P, Thinkhamrop J, Thinkhamrop B. Antibiotic prophylaxis for fourth-degree perineal tear during vaginal birth. *Cochrane Database Syst Rev* 2005 Oct 19;(4):CD005125. DOI: <http://dx.doi.org/10.1002/14651858.CD005125>.
- Cawich SO, Tennant IA, McGaw CD, Harding H, Walters CA, Crandon IW. Infection control practice in the operating room: staff adherence to existing policies in a developing country. *Perm J* 2013 Summer;17(3):e114-8. DOI: <http://dx.doi.org/10.7812/TPP/12-093>.
- Woodhead K, Taylor EV, Bannister G, Chesworth T, Hoffman P, Humphreys H. Behaviours and rituals in the operating theatre. A report from the Hospital Infection Society Working Party on Infection Control in Operating Theatres. *J Hosp Infect* 2002 Aug;51(4):241-55. DOI: <http://dx.doi.org/10.1053/jhin.2002.1220>.
- Beck WC. The surgical mask: another 'sacred cow'? *AORN J* 1992 Apr;55(4):955-7. DOI: [http://dx.doi.org/10.1016/S0001-2092\(07\)70339-3](http://dx.doi.org/10.1016/S0001-2092(07)70339-3).
- Roxburgh M, Gall P, Lee K. A cover up? Potential risks of wearing theatre clothing outside theatre. *J Perioper Pract* 2006 Jan;16(1):30-3, 35-41.
- Stein AD, Makarawo TP, Ahmad MF. A survey of doctors' and nurses' knowledge, attitudes and compliance with infection control guidelines in Birmingham teaching hospitals. *J Hosp Infect* 2003 May;54(1):68-73. DOI: [http://dx.doi.org/10.1016/S0195-6701\(03\)00074-4](http://dx.doi.org/10.1016/S0195-6701(03)00074-4).
- Pittet D, Mourouga P, Perneger TV. Compliance with handwashing in a teaching hospital. *Infection Control Program. Ann Intern Med* 1999 Jan 19;130(2):126-30. DOI: <http://dx.doi.org/10.7326/0003-4819-130-2-199901190-00006>.
- Gammon J, Morgan-Samuel H, Gould D. A review of the evidence for suboptimal compliance of healthcare practitioners to standard/universal infection control precautions. *J Clin Nurs* 2008 Jan;17(2):157-67. DOI: <http://dx.doi.org/10.1111/j.1365-2702.2006.01852.x>.
- Gershon RR, Vlahov D, Felknor SA, et al. Compliance with universal precautions among health care workers at three regional hospitals. *Am J Infect Control* 1995 Aug;23(4):225-36. DOI: [http://dx.doi.org/10.1016/0196-6553\(95\)90067-5](http://dx.doi.org/10.1016/0196-6553(95)90067-5).

**Cures Achieved Regularly**

I often tell medical students and young physicians that if they are going into medicine with cure as their major goal, they should consider obstetrics— a specialty in which cures are achieved regularly. The rest of us spend much of our time trying to control the symptoms of illness.

— James Cleary and Paul B Carbone; *Hospital Practice*; West Conshohocken, PA; 1995