

Table 1.2: Staff time allocation parameters used in costing analysis

Parameter	Value in cost analysis*	Source
Average time taken for UBT device insertion	10 minutes	Reported by senior most doctor
Average time taken for normal vaginal delivery in labour room	7.25 hours	
Average time taken for vaginal delivery with PPH complication, controlled after medical management in LR	10.25 hours	
Average time taken for UBT device retention among those controlled with UBT	24 hours	
Average time in operation theatre for a caesarean section without complications	45 minutes	
Average time in operation theatre for a caesarean section with PPH complication controlled with medical management	60 minutes	
Average time in operation theatre for a caesarean section with PPH complication requiring UBT insertion	75 minutes	
Average time for devascularization surgery after PPH	75 minutes	
Average time for hysterectomy after PPH	120 minutes	
Average time spent in out-patient department	12 hours/week	
Average time spent in indoor patient management	12 hours/week	
Average time spent in operation theatre	12 hours/week	
Average time spent in labour room	2 hours/week	
Average time spent in administration and documentation	10 hours/week	
Average time spent in teaching and training	5.15 hours/week	Reported by sister-in-charge
Average time spent in out-patient department	12 hours/week	
Average time spent in indoor patient management	12 hours/week	
Average time spent in operation theatre	6 hours/week	
Average time spent in administrative work	15 hours/week	Reported by grade 4 worker
Average time spent in labour room by Grade 4 worker	12 hours/week	
Average time spent in operation theatre by Grade 4 worker	12 hours/week	
Mean length of stay for OBGYN patients in ICU	3.47 days	[34]
Mean length of ICU stay for PPH patients	1.5 days	[5]

REFERENCES

- 1 Darwish AM, Abdallah MM, Shaaban OM, *et al.* Bakri balloon versus condom-loaded Foley's catheter for treatment of atonic postpartum hemorrhage secondary to vaginal delivery: a randomized controlled trial. *J Matern Neonatal Med* 2018;**31**:747–53. doi:10.1080/14767058.2017.1297407
- 2 Tindell K, Garfinkel R, Abu-Haydar E, *et al.* Uterine balloon tamponade for the treatment of postpartum haemorrhage in resource-poor settings: A systematic review. *BJOG An Int J Obstet Gynaecol*. 2013;**120**:5–14. doi:10.1111/j.1471-0528.2012.03454.x
- 3 Santhanam R, Viswanathan RM, V. P. Condom tamponade in the management of atonic postpartum hemorrhage. *Int J Reprod Contraception, Obstet Gynecol* 2018;**7**:2276. doi:10.18203/2320-1770.ijrcog20182335
- 4 Rathore AM, Gupta S, Manaktala U, *et al.* Uterine tamponade using condom catheter balloon in the management of non-traumatic postpartum hemorrhage. *J Obstet Gynaecol Res* 2012;**38**:1162–7. doi:10.1111/j.1447-0756.2011.01843.x
- 5 Aderoba A, Olagbuji B, Akintan A, *et al.* Condom-catheter tamponade for the treatment of postpartum haemorrhage and factors associated with success: a prospective observational study. *BJOG An Int J Obstet Gynaecol* 2017;**124**:1764–71. doi:10.1111/1471-0528.14361
- 6 Mishra N, Gulabani K, Agrawal S, *et al.* Efficacy and Feasibility of Chhattisgarh Balloon and Conventional Condom Balloon Tamponade: A 2-Year Prospective Study. *J Obstet Gynecol India* 2019;**69**:133–41. doi:10.1007/s13224-018-1185-6
- 7 Kandeel M, Sanad Z, Ellakwa H, *et al.* Management of postpartum hemorrhage with intrauterine balloon tamponade using a condom catheter in an Egyptian setting. *Int J Gynecol Obstet* 2016;**135**:272–5. doi:10.1016/j.ijgo.2016.06.018
- 8 Anger HA, Dabash R, Durocher J, *et al.* The effectiveness and safety of introducing condom-catheter uterine balloon tamponade for postpartum haemorrhage at secondary level hospitals in Uganda, Egypt and Senegal: a stepped wedge, cluster-randomised trial. *BJOG An Int J Obstet Gynaecol* 2019;**126**:1612–21. doi:10.1111/1471-0528.15903
- 9 Dumont A, Bodin C, Hounkpatin B, *et al.* Uterine balloon tamponade as an adjunct to misoprostol for the treatment of uncontrolled postpartum haemorrhage: A randomised controlled trial in Benin and Mali. *BMJ Open* 2017;**7**:1–9. doi:10.1136/bmjopen-2017-016590
- 10 Lohano R, Haq G, Kazi S, *et al.* Intrauterine balloon tamponade for the control of postpartum haemorrhage. *J Pak Med Assoc* 2016;**66**:22–6.
- 11 Hasabe R, Gupta K, Rathode P. Use of Condom Tamponade to Manage Massive Obstetric Hemorrhage at a Tertiary Center in Rajasthan. *J Obstet Gynecol India* 2016;**66**:88–93. doi:10.1007/s13224-015-0790-x
- 12 Yadav S, Malhotra A. A prospective randomized comparative study of Misoprostol and balloon tamponade using condom catheter to prevent postpartum hemorrhage at M. Y. H., Indore, India in vaginal delivered patients. *Int J Reprod Contraception, Obstet Gynecol* 2019;**8**:591. doi:10.18203/2320-1770.ijrcog20190290
- 13 Revert M, Cottenet J, Raynal P, *et al.* Intrauterine balloon tamponade for management of severe postpartum haemorrhage in a perinatal network: a prospective cohort study. *BJOG An Int J Obstet Gynaecol* 2017;**124**:1255–62. doi:10.1111/1471-0528.14382
- 14 Brown H, Okeyo S, Mabeya H, *et al.* The Bakri tamponade balloon as an adjunct treatment for refractory postpartum hemorrhage. *Int J Gynecol Obstet* 2016;**135**:276–80. doi:10.1016/j.ijgo.2016.06.021
- 15 Vintejeux E, Ulrich D, Mousty E, *et al.* Success factors for Bakri™ balloon usage secondary to uterine atony: A retrospective, multicentre study. *Aust New Zeal J Obstet Gynaecol* 2015;**55**:572–7. doi:10.1111/ajo.12376
- 16 Guo Y, Hua R, Bian S, *et al.* Intrauterine Bakri Balloon and Vaginal Tamponade Combined with Abdominal Compression for the Management of Postpartum Hemorrhage. *J Obstet Gynaecol Canada* 2018;**40**:561–5. doi:10.1016/j.jogc.2017.08.035
- 17 Mathur M, Ng QJ, Tagore S. Use of Bakri balloon tamponade (BBT) for conservative management of postpartum haemorrhage: a tertiary referral centre case series. *J Obstet*

- Gynaecol (Lahore)* 2018;**38**:66–70. doi:10.1080/01443615.2017.1328671
- 18 Wang D, Xu S, Qiu X, *et al.* Early usage of Bakri postpartum balloon in the management of postpartum hemorrhage: A large prospective, observational multicenter clinical study in South China. *J Perinat Med* 2018;**46**:649–56. doi:10.1515/jpm-2017-0249
- 19 Alkiş I, Karaman E, Han A, *et al.* The fertility sparing management of postpartum hemorrhage: A series of 47 cases of Bakri balloon tamponade. *Taiwan J Obstet Gynecol* 2015;**54**:232–5. doi:10.1016/j.tjog.2014.03.009
- 20 Kaya B, Tuten A, Daglar K, *et al.* Balloon tamponade for the management of postpartum uterine hemorrhage. *J Perinat Med* 2014;**42**:745–53. doi:10.1515/jpm-2013-0336
- 21 Laas E, Bui C, Popowski T, *et al.* Trends in the rate of invasive procedures after the addition of the intrauterine tamponade test to a protocol for management of severe postpartum hemorrhage. *Am J Obstet Gynecol* 2012;**207**:281.e1-281.e7. doi:10.1016/j.ajog.2012.08.028
- 22 Olsen R, Reisner DP, Benedetti TJ, *et al.* Bakri balloon effectiveness for postpartum hemorrhage: A ‘real world experience’. *J Matern Neonatal Med* 2013;**26**:1720–3. doi:10.3109/14767058.2013.796354
- 23 Kong CW, To WW. Prognostic factors for the use of intrauterine balloon tamponade in the management of severe postpartum hemorrhage. *Int J Gynecol Obstet* 2018;**142**:48–53. doi:10.1002/ijgo.12498
- 24 Çetin BA, Aydoğan Mathyk B, Atis Aydin A, *et al.* Comparing success rates of the Hayman compression suture and the Bakri balloon tamponade. *J Matern Neonatal Med* 2019;**32**:3034–8. doi:10.1080/14767058.2018.1455184
- 25 Gauchotte E, De La Torre M, Perdriolle-Galet E, *et al.* Impact of uterine balloon tamponade on the use of invasive procedures in severe postpartum hemorrhage. *Acta Obstet Gynecol Scand* 2017;**96**:877–82. doi:10.1111/aogs.13130
- 26 Grange J, Chatellier M, Chev e MT, *et al.* Predictors of failed intrauterine balloon tamponade for persistent postpartum hemorrhage after vaginal delivery. *PLoS One* 2018;**13**:1–11. doi:10.1371/journal.pone.0206663
- 27 Kadioglu BG, Tanriverdi EC, Aksoy AN. Balloon Tamponade in the Management of Postpartum Hemorrhage: Three Years of Experience in a Single Center. *Open J Obstet Gynecol* 2016;**06**:698–704. doi:10.4236/ojog.2016.612087
- 28 Martin E, Legendre G, Bouet PE, *et al.* Maternal outcomes after uterine balloon tamponade for postpartum hemorrhage. *Acta Obstet Gynecol Scand* 2015;**94**:399–404. doi:10.1111/aogs.12591
- 29 Ogoyama M, Takahashi H, Usui R, *et al.* Hemostatic effect of intrauterine balloon for postpartum hemorrhage with special reference to concomitant use of “holding the cervix” procedure (Matsubara). *Eur J Obstet Gynecol Reprod Biol* 2017;**210**:281–5. doi:10.1016/j.ejogrb.2017.01.012
- 30 Son M, Einerson BD, Schneider P, *et al.* Is There an Association between Indication for Intrauterine Balloon Tamponade and Balloon Failure? *Am J Perinatol* 2017;**34**:164–8. doi:10.1055/s-0036-1585084
- 31 Ramanathan A, Eckardt MJ, Nelson BD, *et al.* Safety of a condom uterine balloon tamponade (ESM-UBT) device for uncontrolled primary postpartum hemorrhage among facilities in Kenya and Sierra Leone. *BMC Pregnancy Childbirth* 2018;**18**:1–7. doi:10.1186/s12884-018-1808-z
- 32 Burke TF, Ahn R, Nelson BD, *et al.* A postpartum haemorrhage package with condom uterine balloon tamponade: a prospective multi-centre case series in Kenya, Sierra Leone, Senegal, and Nepal. *BJOG An Int J Obstet Gynaecol* 2016;**123**:1532–40. doi:10.1111/1471-0528.13550
- 33 Burke TF, Danso-Bamfo S, Guha M, *et al.* Shock progression and survival after use of a condom uterine balloon tamponade package in women with uncontrolled postpartum hemorrhage. *Int J Gynecol Obstet* 2017;**139**:34–8. doi:10.1002/ijgo.12251
- 34 Joseph CM, Bhatia G, Abraham V, *et al.* Obstetric admissions to tertiary level intensive care unit – Prevalence, clinical characteristics and outcomes. *Indian J Anaesth* 2018;**62**:940–4. doi:10.4103/ija.IJA_537_18
- 35 Rastogi A, Zahid. Postpartum haemorrhage | National Health Portal Of India. Natl. Heal. Portal India. 2017.<https://www.nhp.gov.in/disease/gynaecology-and-obstetrics/postpartum->

- haemorrhage (accessed 20 Jul 2020).
- 36 Carroli G, Cuesta C, Abalos E, *et al*. Epidemiology of postpartum haemorrhage: a systematic review. *Best Pract. Res. Clin. Obstet. Gynaecol.* 2008;**22**:999–1012. doi:10.1016/j.bpobgyn.2008.08.004
- 37 Dutta D. *Textbook of Obstetrics*. 2015.
- 38 Tasneem F, Sirsam S, Shanbhag V. Clinical study of post partum haemorrhage from a teaching hospital in Maharashtra, India. *Int J Reprod Contraception, Obstet Gynecol* 2017;**6**:2366. doi:10.18203/2320-1770.ijrcog20172314
- 39 International Institute for Population Sciences. National Family Health Survey (NFHS-4) 2015-16 India. *Int Inst Popul Sci ICF* 2017;;1–192. doi:kwm120 [pii]10.1093/aje/kwm120