

# Index

---

- abdominal pregnancy,
    - case reports 583
    - diagnosis 584
    - hemorrhage from 583–6
    - incidence 584
    - timing of intervention 584
  - abdominal wall, bleeding from during cesarean section 448
  - ABO compatibility 31
  - abortion 276, 277
    - morbidity reduction after 286
    - using misoprostol 285
  - accurate rate determination 152–8
  - acid hematin method 84
  - acidosis as part of 'lethal triad' 24
  - acquired disorders of hemostasis 199–204
  - acquired hemophilia 206
  - acquired vascular malformations 218
  - active management of third stage of labor (AMTSL) 101–106, 113–124
    - cf expectant 105, 113, 126
    - components of 66
    - current guidance for clinicians 124
    - EUPHRATES consensus on 111
    - FIGO guidelines on 608
    - historical 60
    - in Benin 123
    - in Mali 123
    - misoprostol of oxytocin 284
    - PPH incidence and 113, 157
    - recommendations for 361
    - suggested steps in 117–19
    - techniques for and comparison of studies 134
    - uterotonic agents 101–5, 114
    - without controlled cord traction 116
  - acute fatty liver of pregnancy 204
  - acute hemolytic transfusion reaction 37
  - acute normovolemic hemodilution 591, 592
  - acute uterine inversion 185–8
  - ADAMTS 13 204
  - adherent placenta, *see* placenta accreta, placenta increta, placenta percreta
  - Afghanistan, misoprostol use in 557
  - afibrinogenemia 212, 213
  - Africa,
    - B-Lynch compression suture use in 437
    - maternal morbidity 137
    - maternal mortality 136
    - severe acute maternal morbidity in 501
  - age,
    - mortality and 170
    - placenta accreta incidence and 247
    - placenta previa risk 231
    - PPH incidence and 152, 155
    - PPH risk 139
  - airway management 520
  - alcohol effect on vascular system 403
  - algorithms,
    - blood transfusion refusal care pathway 595
    - instrumental delivery and PPH 5
    - management of major PPH 196
    - management of placenta accreta 243
    - management of PPH 349
    - PPH after elective cesarean section 7
    - PPH after emergency cesarean section in first stage of labor 8
    - PPH in elective cesarean for adherent placenta 10
    - PPH in emergency cesarean for adherent placenta 11
    - PPH in failed sequential instrumental delivery/emergency cesarean 9
    - PPH management in UK 167
    - PPH scenario in vaginal delivery 4
    - proposed management scheme within hospitals 343
    - recommended protocol for placenta accreta/increta/percreta 410
    - tamponade method 390
    - use of internal uterine balloon 385
  - allergic reaction
    - to blood transfusion 39
    - to iodine 409
  - alloantibodies 31
  - alloimmunization 27, 37, 356
  - amniotic fluid,
    - cell salvage methods contraindicated by presence of 578
    - in vitro* studies of clearance 579
    - leukocyte depletion filters 580
  - amniotic fluid embolism 491
  - as a cause of consumptive coagulopathy 205
  - cell salvage methods and 578
  - in Japan 172
- analgesia,
    - and PPH risk 142
    - for balloon insertion 391
  - anaphylaxis and blood transfusion 39
  - anastomoses,
    - between uterine and vaginal arteries 20, 21
    - between uterine arteries with arteries to lower ureters 404
    - major pelvic 442
    - of internal iliac artery 442
    - subplacental uterine network 490
    - tying of uterine and ovarian anastomoses 452
    - uterine anastomotic system 267
  - anatomy,
    - of internal iliac artery 441
    - for internal iliac artery ligation 455
    - of uterine arteries 177–83
    - pelvic vessels 445
    - surgical for placenta accreta management 264
    - vascular supply of pelvis 332, 399–400
  - anemia,
    - antenatal correction 165, 194
    - delayed clamping of cord and reduction 118
    - management in women refusing blood transfusion 598
    - management postpartum in Jehovah's Witnesses 591
  - angiogram,
    - arterial anastomotic system between vaginal and uterine arterial systems 20
    - false aneurysm 471
    - proof of pseudoaneurysm 222, 223
    - pseudoaneurysm of uterine artery 13
  - animal studies of pneumatic anti-shock garments 333
  - antenatal PPH prevention 549
  - ante-partum hemorrhage and PPH risk 140
  - anti-shock garments,
    - G-suit 319
    - history of 331
    - medical anti-shock trousers 318
    - non-pneumatic anti-shock garment 315, 318–328, 331–339, 454, 558
    - pneumatic anti-shock garment 318, 319

- use for abdominal pregnancy 585
- antibiotic use in secondary PPH 469
- anticoagulant therapy,
  - during pregnancy and peripartum 206–8
  - epidural anesthesia and 207
- antifibrinolytic therapy 36
- antiphospholipid syndrome 201
- aortic compression 6
  - FIGO guidelines on 613
  - intraoperative 10
- arterial blood pressure measurement 76
- arterial embolization 5
  - for cervical and vaginal vault tears 195
  - for supralelevator hematoma 197
  - in secondary PPH 470
  - selective during operative delivery of infant in placenta accreta 255
  - use in Japan 171
- arteriovenous malformations 495
- artery, *see specific arteries by name*
- Asia, severe acute maternal morbidity in 501
- atony, *see uterine atony*
- Australia,
  - accurate PPH rate determination 152
  - hysterectomy for secondary PPH in 470
  - maternal morbidity 137
  - severe acute maternal morbidity in 507
- autologous blood transfusions 577–82
  - use in Jehovah's Witnesses 590
- autopsy,
  - after PPH 496
  - litigation after lack of 532
- B-Lynch compression suture,
  - FIGO guidelines on 616
  - technique 434–6, 438
- Bakri balloon 369, 370, 378, 379, 387–96
  - deflation regimen 391
  - insertion 372
  - mechanism of action 373
  - method of insertion 390
  - methodological parameters of use 389
  - quality Doppler profile 92
  - selection of 372
  - study results with 371
  - success rate 391
- balloon tamponade 369–75
  - balloon–uterus interface 374
  - complications 409
  - devices for obstetric hemorrhage
    - equipment tray 315
  - FIGO guidelines on 615
  - mechanism of action 373
  - occlusion by 404
  - placement of 408
  - pressure–volume relationships 374
  - uterine-specific cf non-specific balloons 387
  - uterine specific 369
  - uterovaginal balloon system 458–460
- Bangladesh,
  - blood loss assessment by mat 354, 558
  - hydrostatic condom catheter 379
  - misoprostol use in 286
- Belfort–Dildy Obstetrical Tamponade System 460
- Belgium, accurate PPH rate determination in 154
- Benin, active management of third stage of labor in 123
- Bernard–Soulie syndrome 208
- bimanual compression of uterus 434
  - FIGO guidelines on 613
- biochemical markers for placenta accreta 248
- biologically active topical hemostatic agents 481–5
- bipartite placenta 236
- bipedal locomotion and PPH 59
- bladder,
  - adherent placenta 10
  - injuries and ventouse delivery 5
- blood component administration 38
- blood loss,
  - accurate estimation,
    - BRASSS-V drape 81, 84–6, 134, 557
    - reduced severe acute maternal morbidity and 508
  - assessing 73
  - assessment pitfalls 81–86
  - before and after anti-shock garment use 335
  - calibrated drapes cf visual assessment 86
  - causes of excessive 448
  - classification of PPH based on 129
  - clinical estimation 82
  - determination and comparison of studies 133
  - direct collection of 83–6
  - during placenta accreta surgery 268
  - estimation from kanga 83, 353, 557
  - in active management cf expectant 105
  - inaccurate estimation and maternal mortality 164
  - measurement of and comparison of studies 134
  - mechanism of action of anti-shock garments in 319
  - non-pneumatic anti-shock garment for 318, 337
  - normal loss during delivery 81
  - physiological adaptations for 82
  - rapidity 129
  - visual estimation 71
  - volume deficit 130
- blood mat 354, 558
- blood products, *see transfusion*
- blood supply,
  - S1 and S2 in placental invasion 267
  - uterovaginal 19–23
- blood transfusion, *see transfusion*
- blood volume 73
- blunt abdominal trauma 189–91
- body mass index (BMI),
  - external abdominal pressure and 336
  - PPH incidence and 156
  - PPH risk and 139
- bowel obstruction and fibrin sealants 484
- Brace suture technique 433, 452
- bradykinin 581
- brain size,
  - early delivery of humans cf other primates 59
  - PPH and 55
- Brandt–Andrews technique for AMTSL 134
- BRASSS-V drape™ 81, 84–6, 134, 557
- breast milk 362
- breathing management 520
- broad ligament arteries, prepregnancy hemodynamics 179
- BT-Cath balloon 369
- calibrated drapes 84–6
- Canada,
  - accurate PPH rate determination 153
  - B-Lynch suture compression suture use in 438
  - maternal morbidity 137
  - near miss data collection in 148
  - planned home deliveries in 572
  - severe acute maternal morbidity in 501, 506
- carbetocin 102, 361–7
  - cf oxytocin 362, 363
  - cf Syntometrine 363
  - comparison of studies 363
  - contraindications 364
  - cost-effectiveness 366
  - current role as uterotonic 366
  - pharmacology 361
  - side-effects 364, 366
  - use at cesarean section 362
  - use at vaginal delivery 363
- carboprost,
  - for uterine atony 357
  - side-effects 357
- cardiac output measurement 521
- care plan for women in labor refusing
  - blood transfusion 597
- case reports 546–8
  - abdominal pregnancy hemorrhage treatment 583–6
- catheterization routes 408
- cell salvage use in Jehovah's Witnesses 590
- central venous pressure 75, 76
- cervix,
  - endocervical tear 491
  - postpartum pathology of 490
  - priming with misoprostol 279
  - tears 194
    - repair 195, 197
- cesarean section,
  - and PPH risk 141
  - bleeding from uterine incision 449
  - carbetocin use at 362
  - causes of excessive bleeding during 448
  - classical 451
  - combating hemorrhage during 448–57
  - elective,
    - and PPH 156
    - for adherent placenta 10
    - PPH after 7
    - timing of 438
  - emergency
    - for unexpected adherent placenta 11
    - PPH in first stage of labor 8
  - European consensus on prevention and management of PPH at 111

- for placenta accreta 242–4  
 for placenta previa 234–35  
 fundal route 11, 12  
 lack of surgical competency 163  
 placenta accreta incidence and 247  
 PPH incidence and 156  
 previous and risk of placenta previa 231  
 sites of excessive bleeding during 448  
 trial of labor after 189  
 uterine incision for 449–51  
 uterine rupture and previous 188  
 with hysterectomy for placenta accreta 242  
 wound dehiscence 467
- checklist for women in labor refusing blood transfusion 599
- chemotherapy for choriocarcinoma 471
- chittengue and blood loss assessment 354
- Cho compression suture, FIGO guidelines on 616  
 multiple square sutures 438
- chorioamnionitis 453  
 PPH incidence and 156  
 PPH risk and 143
- choriocarcinoma, chemotherapy for 471  
 secondary PPH and 467
- chronic uterine inversion 188
- circulating volume 73–9  
 assessment of 73  
 replenishment of 77
- circulatory management 521
- classifications, based on blood loss 129  
 based on causative factors 130  
 conventional temporal 129  
 of bleeding from lower genital tract 193  
 of PPH 82  
 pitfalls 130  
 proposed 131  
 volume deficit 130
- coagulation at placental site 96
- coagulation cascade 481
- coagulation system changes during pregnancy 199
- coagulopathy 3, 78  
 acquired disorders of hemostasis 199–204  
 and PPH risk 140  
 as part of 'lethal triad' 24  
 consumptive 204–8  
 in obstetric hemorrhage 415  
 in placental abruption 229  
 in pregnant Jehovah's Witnesses 589  
 in secondary PPH 471  
 management of 46  
 maternal mortality 164  
 of sepsis 485  
 pathophysiology of 45  
 rare disorders 212–15  
 recognition of 418  
 in bleeding from lower genital tract 194  
 secondary PPH and 467  
*see also by specific disorder*
- coil deployment in non-targeted embolization 403
- collagen–thrombin–fibrinogen patch 483
- collateral arteries 400
- collateral uterine arteries 179
- colloids for volume expansion 77
- colporrhexis 189
- colpouterine system (neovascularization) 266
- combined deficiency of factors II, VII, IX and X 214
- combined factor V and VIII deficiency 214
- common iliac artery, avoidance of accidental ligation 446
- common iliac balloon, X-ray image 6
- common vein, damage to during hypogastric artery ligation 446
- communication, barriers to 559  
 effective 552  
 improvements in to reduce maternal mortality 166  
 in development of hospital systems for PPH 341  
 problems and maternal morbidity and mortality 308, 309
- community, mobilization for continuum of care 555  
 out-of-hospital deliveries 571–4  
 PPH management at community level 353
- community-based continuum of care 555–60
- community-based emergency care 542  
 FIGO guidelines on 612
- competence, lack of surgical competency 163  
 litigation over insufficient experience 532  
 surgeon experience 433  
 surgical management of placenta accreta 453
- compression sutures, B-Lynch 434–6, 438  
 brace stitch 452  
 cf iliac artery ligation 457  
 Cho multiple square sutures 438  
 Hayman uterine compression suture 438, 453
- concealed PPH 13
- Confidential Enquiry into Maternal and Child Health, changes since 1985 162–7  
 recommendations 166
- confounders when comparing international PPH statistics 134
- congenital arteriovenous malformations 218
- congenital disorders of hemostasis 208–10
- congenital factor VII deficiency 415
- congenital platelet disorders 208
- connective tissue disorders and PPH risk 140
- conservative surgery 433–440
- consumptive coagulopathy 204–8
- continuum of care model 555–60
- contractions, inefficient and PPH 91  
 pathophysiology of PPH and 94–9
- controlled cord traction 115  
 active management without 116  
 FIGO guidelines on 609  
 technique 118
- conventional temporal classification of PPH 129
- costs, cost effectiveness of misoprostol use 541  
 cost-effectiveness of carbetocin 366  
 of mifepristone/misoprostol in placenta accreta 261  
 of misoprostol 286, 287, 358  
 of surgery 541  
 of training for teamwork 565  
 of uterotonics 115
- coumarin use during pregnancy 207
- counseling in antenatally diagnosed placenta accreta 251
- cryoprecipitate, and plasma for transfusion 33  
 cf fibrinogen concentrate 46  
 cf fibrinogen concentrate and fresh frozen plasma 50  
 reduced 33
- crystalloids, for volume expansion 77  
 use during placenta accreta surgery 268
- cystoscopy 5  
 in placenta accreta 254
- deep vein thrombosis after placenta accreta surgery 270
- definitions 133, 155, 550, 608
- dehydration postlabor 4
- devascularization, stepwise 20, 439–40, 452
- diabetes, and PPH risk 139  
 antenatal treatment of 194
- dinoprost 358
- dinoprostone in first stage management and PPH 157
- direct collection of blood loss 83–6
- disseminated intravascular coagulation 45, 204–8  
 after endocervical tear 491  
 in abdominal pregnancy 583  
 in placenta accreta 252  
 in placental abruption 229, 230
- documentation by midwife of PPH 551
- Dominican Republic, misoprostol use in 286
- Doppler analysis, esophageal 521  
 hemodynamic changes in uterine blood flow 89–93  
 imaging for placenta accreta 248, 249  
 intrapartum velocimetry 89
- drills, cf skills and scenarios for training 307
- drug-induced thrombocytopenia 202
- duration of labor, PPH incidence 157  
 PPH risk 141
- dysfibrinogenemia 212, 213
- early clamping of umbilical cord 105
- early warning score chart 18
- ebb™ Complete Tamponade System 369, 460
- ectopic pregnancy, embolization for 412
- Ecuador, pyrexia after misoprostol in 299, 300

- education,  
 basic equipment list for practical PPH training 309  
 courses and workshops 518  
 drills teaching 307–8  
 for labor ward drills 305  
 for visual estimation of blood loss 71  
 guide to PPH management poster 515  
 hands-on training 516  
 in development of hospital systems for PPH 341  
 large volume transfusion protocol 349, 350  
 learning from past mistakes 562–6  
 lecture-based training 516  
 low fidelity models 517  
 MamaNatalie® birthing simulator 602–3  
 maternal mortality reduction and education of women in low resource settings 543  
 modern teaching/learning modalities 514–18  
 Obstetric Hemorrhage Education Project 348–50  
 practical emergency training 312  
 preparation for PPH management 305–10  
 scenario teaching 309–10  
 self-learning of uterine vascular supply 23  
 simulations 516  
 skills stations 349  
 skills teaching 308–9  
 techniques for 305–6  
 training and reduction of severe acute maternal morbidity 510  
 training for teamwork 562–6  
 training of midwives 552
- Egypt, non-pneumatic anti-shock garment trials in 322–7
- embolization,  
 and balloon catheter placement 398–412  
 bilateral of uterine artery 470  
 complications 398, 409  
 contraindications 398  
 for ectopic pregnancy 412  
 for vascular malformations 220  
 imaging for 406  
 importance of arterial knowledge in radiographers 6  
 in placenta accreta 408  
 location for and arterial puncture 406  
 logistics of 411  
 materials for 400–5  
 methods of action of embolic materials 402  
 non-target 6  
 of pelvic artery in placenta accreta 253  
 of uterine artery 405  
 preparation before 405  
 pressure needed for 405  
 targets of 406
- emergency care in low resource settings 543, 559
- Empress Mumtaz 64
- endocrine mechanisms and uterine muscle activity 95
- endometriosis and excessive bleeding at cesarean section and 449
- endometritis 466, 469
- endomyometritis 495
- England,  
 maternal morbidity 137  
 severe acute maternal morbidity in 501
- epidemiology comparing international PPH statistics 133–43
- epidural anesthesia and anticoagulant therapy 207
- epilepsy and PPH risk 140
- episiotomy,  
 and PPH risk 143  
 as cause of hemorrhage 194  
 for vaginal trauma treatment 4
- equipment,  
 basic list for practical PPH training 309  
 preparedness for PPH 314–15  
 tray for PPH 314
- ergometrine,  
 contraindications 114  
 for uterine atony 357  
 isolation of 355  
 plus oxytocin vs. oxytocin alone 103  
 side-effects 357  
 storage costs 115  
 use in secondary PPH 469  
 warning on use 66
- ergot, as historical therapy 355
- ergot alkaloids,  
 FIGO guidelines on use 612  
 prophylactic use of 104  
 vs. oxytocin 102
- ergotoxine 355
- esophageal Doppler 521
- ethanolamine oleate use with gelatin sponge 404
- ethics,  
 cell salvage methods in Jehovah's Witnesses 579  
 considerations in hospital-based near miss research 151  
 of misoprostol use 287  
 use of fibrin sealants in Jehovah's Witnesses 475
- ethnicity,  
 PPH incidence 156  
 PPH risk 139
- etiology,  
 of acute uterine inversion 185  
 of PPH 65, 138–9
- EUPHRATES study 109–12
- Europe,  
 B-Lynch suture compression suture use in 438  
 severe acute maternal morbidity in 501
- European consensus on prevention and management of PPH 109–12
- evolution and PPH 55–61
- expectant management,  
 cf active 105  
 cf AMTSL 126
- exsanguinating patient as a model for PPH management 24–7
- external abdominal pressure,  
 anti-shock 336  
 BMI and 336
- external aortic compression device 335
- external iliac artery, avoidance of accidental ligation 446
- extrinsic arteries of uterus 178
- factor II, VII, IX and X (combined) deficiency 214
- factor V deficiency 213
- factor V Leiden as clue to history of PPH 60
- factor V and VIII (combined) deficiency 214
- factor VII,  
 recombinant activated 359, 415–28  
 clinical effect 418  
 mechanism of action 417  
 pharmacokinetic studies of 417  
 production of 416  
 recommendations for use in PPH 427–8  
 safety 419, 427  
 worldwide experience with 420–6  
 recombinant vs. plasma-derived 417  
 structure of human 416
- factor VII deficiency 213
- factor VIII deficiency, and PPH 96  
 and secondary PPH 467
- factor VIII inhibitors 206
- factor X deficiency 214
- factor XI deficiency 214
- factor XIII deficiency 214
- FAST HUG approach 525
- febrile non-hemolytic transfusion reaction 39
- fertility,  
 after embolization 411  
 after internal iliac artery ligation 457  
 after placenta accreta 260  
 maintenance of with internal iliac artery ligation 445
- fetal anomalies and risk of placenta previa 231
- fetal nutrient requirements and PPH 59
- fetomaternal hemorrhage 191
- fetomaternal transfusion and early clamping 105
- fibrin sealants 474–6, 480–5  
 method of use illustrations 478–9  
 patch 482  
 spray 482
- fibrinogen,  
 cf cryoprecipitate 46  
 cf fresh frozen plasma and cryoprecipitate 50  
 early use in PPH 45–7  
 fibrinogen replacement therapy 49  
 inherited abnormalities of 212  
 role in massive transfusion 35  
 use in PPH 48
- fibroids,  
 and PPH risk 140  
 secondary PPH after 466
- fibrosis of vesicouterine plane 265
- FIGO,  
 FIGO 2012 PPH guideline for low resource countries 67  
 guidelines for PPH prevention and treatment in 607–18  
 joint statement with ICM on Management of Third Stage of Labor to Prevent PPH 121

- modern teaching/learning modalities for PPH management 514  
 recommendations 118  
   for non-pneumatic anti-shock garment 318
- Finland,  
   severe acute maternal morbidity in 506  
   unplanned home deliveries in 572
- FloSeal 480–5
- Foley catheter 379
- fondaparinux use during pregnancy 207
- forceps delivery and PPH 6
- France,  
   accurate PPH rate determination 153  
   maternal mortality 136  
   severe acute maternal morbidity in 501  
   use of anti-shock garments in 320
- fresh frozen plasma 32
- fundus,  
   fetal delivery through 11  
   postpartum pathology of 493–4
- G-suit 319
- gelatin sponge 400, 470
- gelatin–thrombin matrix 480, 482, 483
- gemeprost 358
- Glanzmann's thrombasthenia 208, 415
- Glasgow Coma Scale 523
- glues,  
   effect on vascular system 403  
   fibrin sealants 474–6, 480–5  
   method of use illustrations for fibrin sealants 478–9  
   topical hemostatic agents 480–5
- gravimetric method of blood loss measurement 84
- guide to PPH management poster 515
- guidelines,  
   current guidance for clinicians on ALTSL 124  
   FIGO 2012 PPH guideline for low resource countries 67  
   for PPH prevention and treatment in 607–18  
   for uterine-specific balloons 392
- Guinea, severe acute maternal morbidity in 501
- Haultian technique for acute uterine inversion 187
- Hayman uterine compression suture 438, 453
- health care infrastructure in India 542–4
- heart valve prostheses 207
- HELLP syndrome 40, 82  
   cell salvage methods in 579  
   severe acute maternal morbidity in 504  
   with pre-eclampsia 203
- hematocrit,  
   changes in and PPH classification 129  
   PPH definition from 155
- hematoma,  
   estimation of size by imaging 406  
   management of 196–8  
   paravaginal 193  
   postpartum 194
- rectus sheath 14
- retroperitoneal 14
- secondary PPH after 466
- vaginal, topical hemostatic agents for 485
- hemodynamics,  
   changes in uterine blood flow 89–93  
   changes in uterus during pregnancy 177–83  
   during pregnancy 180–3  
   of pneumatic anti-shock garment use 334  
   prepregnancy 177–81
- hemoglobin,  
   determination of changes in 84  
   restoration of levels 78
- hemolytic disease of the newborn 31
- hemolytic uremic syndrome 203
- hemophilia 211–12  
   in secondary PPH 471  
   recombinant activated factor VII for 415  
   secondary PPH and 467
- hemorrhagic shock,  
   cardiovascular physiology of 332  
   choice of volume expansion fluid for 77  
   decreased recovery times with non-pneumatic anti-shock garment 323  
   early recognition of 24  
   identification of 550  
   in acute uterine inversion 185  
   in placental abruption 230  
   internal iliac artery ligation for 444  
   stages of 74
- hemostasis,  
   after placenta accreta surgery 269  
   congenital disorders of 208–10  
   disorders of 199–215  
   mechanism of by factor VII 417–18  
   use in Jehovah's Witnesses 590
- hemostatic dressings 25
- hemostatic resuscitation 25
- heparin use during pregnancy 206
- heparin-induced thrombocytopenia 202
- hepatitis C and litigation 530
- history,  
   maternal mortality 545  
   of anti-shock garments 331  
   of PPH 545  
   previous cesarean and PPH risk 141  
   previous PPH and PPH risk 141, 156  
   therapies used for PPH 355
- HIV,  
   cell salvage methods contraindicated by 578  
   HIV-associated thrombocytopenia 202  
   litigation 529
- home deliveries 571–4
- home-based life-saving skills, FIGO guidelines on use 612
- hospitals,  
   hospital-based near miss research 150  
   impact of new systems on outcome 344  
   intensive care management of PPH 520–5
- obstetric hemorrhage equipment tray in 314
- out-of-hospital deliveries 571–4
- preparation of, labor ward drills 305–10
- preparation protocols for management of PPH 343
- proposed management scheme within 343
- systems for care of women with PPH 341–7
- Huntington technique for acute uterine inversion 187
- hydrostatic condom catheter 379
- hydrostatic intrauterine balloon tamponade, FIGO guidelines on 615
- hyperkalemia 27
- hypertension 82  
   malignant 533  
   *see also* pre-eclampsia
- hypocalcemia 27, 40
- hypofibrinogenemia 35, 212, 213
- hypogastric artery, *see* internal iliac artery
- hypokalemia 27, 40
- hypotension and leukocyte depletion filters 581
- hypothermia 40  
   as part of 'lethal triad' 24
- hypovolemia-related complications 409
- hypovolemic shock 73  
   as a cause of consumptive coagulopathy 205  
   cardiovascular physiology of 332  
   choice of volume expansion fluid for 77  
   decreased recovery times with non-pneumatic anti-shock garment 323  
   early recognition of 24  
   identification of 550  
   in acute uterine inversion 185  
   in placental abruption 230  
   internal iliac artery ligation for 444  
   stages of 74
- hysterectomy 453
- adherent placenta and 11  
   after uterine rupture 189  
   as treatment for S1 and S2 bleeding 7  
   avoidance of by having obstetric hemorrhage equipment tray 315  
   *cf* balloon tamponade 383  
   comparisons 509  
   consent for in management of placenta accreta 253  
   for supravaginal hematoma 197  
   impact of new hospital systems on incidence 345  
   incidence of emergency 458  
   pathology of uterine specimens from 489–97  
   peripartum 462–4  
   impact of new hospital systems on incidence 346  
   indications for 462  
   severe acute maternal morbidity after 507  
   surgical principles of 463–4  
   use in Japan 171
- hysterotomy for compression suture after vaginal delivery 436

- idiopathic thrombocytopenic purpura 200
- Illinois model of training 348–50
- incidental thrombocytopenia 200
- India,
  - abdominal pregnancy hemorrhage experience 583–6
  - health care infrastructure 542–4
  - MamaNatalie® newborn simulator trials 603
  - management of PPH in 539
  - surgical management of placenta accreta in 454
- Indonesia, severe acute maternal morbidity in 501
- induction of labor,
  - by misoprostol 285
  - PPH incidence 156
  - PPH risk 141
- infection,
  - after embolization 410
  - after placenta accreta 260
  - peripartum hysterectomy and sepsis 463
  - septic transfusion reaction 37
- infravalvator hematoma 196
- inherited abnormalities of fibrinogen 212–15
- inotropes 522
- instrumental delivery,
  - failed 9
  - genital tract trauma and maternal mortality 164
  - PPH incidence and 156
  - PPH scenario 5
- intensive care management 520–5
  - airway 520
  - breathing 520
  - circulatory 521
  - discharge and follow-up 525
  - FAST HUG approach 525
  - gastrointestinal 524
  - general management 524
  - hematological 524
  - neurological 523
  - pain relief and sedation 524
  - renal 523
  - sepsis 524
- internal iliac artery,
  - anastomoses of 442
  - anatomy of 441
  - bilateral vs. unilateral ligation 443
  - ligation of 441–7, 455–7
    - accidental ligation of common or external iliac artery 446
    - anatomic considerations 455
    - complications 456
    - damage to during hyogastric artery ligation 446
    - indications for 457
    - procedures for 455, 456
    - prophylactic 442
    - reasons for failure 446
    - reproductive function after 445, 457
    - surgeon position for 446
    - therapeutic 443
    - ureteric damage during 446
- International Classification of Diseases, PPH coding 155
- International Classification of Diseases, changes in coding 157
- International Collaborative Group 154
- International Confederation of Midwives (ICM),
  - joint statement with FIGO on Management of Third Stage of Labor to Prevent PPH 121
  - modern teaching/learning modalities for PPH management 514
  - recommendations 118
  - for non-pneumatic anti-shock garment 318
- intimate partner abuse and abdominal trauma 189–91
- intra-abdominal pressure and non-pneumatic anti-shock garment use 338
- intraluminal pressure,
  - pressure readings 369–75
  - corresponding blood pressures 373
  - of different balloons 370
  - relationship with systolic blood pressure 374
- intraoperative aortic compression 10
- intraoperative autologous blood transfusions 577–82
- intraoperative cell salvage 592
  - use in Jehovah's Witnesses 590
- intrapartum PPH prevention 550
- intraoperative hemorrhage 164
- intraplacental lacunae 241
- intrauterine fetal death, misoprostol use after 286
- intrinsic arteries of uterus 179
- invasive pattern of human placentation 56
- inverted uterus,
  - hydrostatic repositioning 16
  - manual repositioning 15
- Ireland, severe acute maternal morbidity in 507
- iron overload 27
- ischemia, postembolic 410
- ischemic necrosis of distal organs, in placental abruption 230
- isoimmunization in placental abruption 230
- isthmial tourniquet 451
- Italy, experience with internal uterine tamponade 381–5
- Japan, declining maternal mortality rate in 169–74
- Jehovah's Witnesses,
  - anemia management in 591
  - antenatal management 589
  - blood transfusions and 587–92
  - cell salvage methods in 579
  - intraoperative cell salvage for 950
  - management in labor 589
  - management of hemorrhage in 590
  - use of cryoprecipitate in 33
  - use of fibrin sealants in 475
  - view of medicine and blood 587
- kanga,
  - blood loss assessment from 353, 557
  - in Tanzania 83
- kapulana, blood loss assessment from 354
- labor duration and PPH risk 141
- labor induction,
  - after fetal death 278
  - and PPH risk 141
  - by misoprostol 278, 285
- labor ward drills 305–10
  - assessment of visual blood loss estimation 71
- lacunae, placental 248
- large volume transfusion protocol 349, 350
- Latin America, severe acute maternal morbidity in 501
- learning processes 305
- leiomyomata,
  - postpartum pathology of 495
  - uterine atony risk and 356
- 'lethal triad' 24
- leukocyte depletion filters 580
- levator ani muscle, sutured injury of 14
- ligation,
  - accidental 446
  - of internal iliac artery 441–7, 455–7
  - of uterine artery 452
- ligature placement for stepwise devascularization 439
- litigation 527–35
  - abandonment 535
  - dangerous sidewalk 527
  - delay in transfusion 530
  - disappearing baby 534
  - early discharge 531
  - first maternal death litigation 527
  - health insurance 528
  - hepatitis C 530
  - HIV 529
  - iatrogenic obstetric injury 528
  - inadequate staffing 532
  - infections after transfusion 529
  - insufficient experience 532
  - malignant hypertension 533
  - no autopsy 532
  - no expert medical report 533
  - no operation note 533
  - obstetrician on vacation 531
  - PPH in an aircraft 534
  - PPH in dog 535
  - PPH into pleural cavity 534
  - road traffic accident 528
  - Sheehan syndrome 533
  - suing wrong doctor 532
  - telephone problem 528
  - transfusion of wrong blood 528
  - unlawful practice of medicine 527
  - unlicensed practice of obstetrics 531
- Logothetopoulos pack 458
- low resource settings,
  - adequacy of delivery setting 540
  - benefit of non-pneumatic anti-shock garment in 320
  - community-based continuum of care 555–60
  - emergency care in 559
  - FIGO guidelines for PPH prevention and treatment in 607–18
  - health care infrastructure in 542
  - management of PPH in 539–44
  - measurement of blood loss using BRASS-V drape in 85
  - medical management of PPH 540
  - misoprostol use in 285

- severe acute maternal morbidity in 501
- surgical management of PPH 541
- use of pelvic pressure pack during transport to tertiary care 460
- lower genital tract bleeding 193–8
- lower uterine segment, postpartum pathology of 491–3
- lower uterine vascular supply, anatomy of 19–23
- dissections showing 22
- macrosomia 58, 140
- magnetic resonance imaging (MRI), before embolization to identify placental abnormalities 406
- for placenta accreta 250
- guidelines for placental 17
- imaging for placental invasion 267
- Malawi, MamaNatalie® newborn simulator trials in 603
- Mali, AMTSL in 123
- malignant hypertension, litigation 533
- MamaNatalie® birthing simulator 602–3
- massive transfusion, battlefield evidence 34–5, 46
- complications 27
- in PPH 34–37
- in trauma 35
- protocols 26, 36
- transfusions after 27
- maternal circulation to placenta 180
- maternal morbidity, after peripartum hysterectomy 462
- after placenta accreta management 243, 244
- communication and 308, 309
- denominators used in calculation of 135
- determination of near misses 147
- determining incidence 147–51
- hospital-based near miss research 150
- in Africa 137
- in Australia 137
- in Canada 137
- in England 137
- in Scotland 136
- in USA 137
- morbidity–mortality continuum 500
- near miss data collection in Canada 148
- non-pneumatic anti-shock garment use 325
- organ-dysfunction approach to maternal near miss 148
- out-of-hospital deliveries and 573
- risk in Jehovah's Witnesses 588
- severe acute 499–511
- maternal mortality, after peripartum hysterectomy 462
- after uterine rupture 188
- age and 170
- antenatal care and 165
- case reports from history 546–8
- coagulopathy 164
- communication and 308, 309
- improvements and 166
- deaths averted by misoprostol use 286
- declining rate in Japan 169–74
- denominators used in calculation of 135
- elimination in UK 165
- from emergency hysterectomy 458
- from PPH in developed countries 153
- from PPH in UK 162–7
- geographical variations in 170
- globally 135
- historical perspective 545
- historical rates 55
- impact of new hospital systems on 345
- in 19th century England 355
- in Africa 136
- in France 136
- in placenta accreta 247
- in UK 135
- in USA 136
- inaccurate blood loss estimation 164
- increase in Illinois 348
- instrumental delivery 164
- leading cause 55
- morbidity–mortality continuum 500
- non-pneumatic anti-shock garment use 325
- placenta previa 163
- placental abruption 162
- prevention strategies in low resource settings 542–4
- refusal of care and 165
- release for hospital form for women refusing transfusion 600
- risk in Jehovah's Witnesses 588
- uterine rupture 164
- Matthew Duncan separation method 95
- May–Hegglin anomaly 208
- mechanical heart valve prostheses 207
- medical anti-shock trousers 318
- medical termination of pregnancy using misoprostol 276, 277, 285, 286
- medical therapy 355–9
- menstruation after embolization 411
- methotrexate, cf mifepristone/misoprostol in placenta accreta 260
- for abdominal pregnancy 586
- for conservative management of placenta accreta 454
- for placenta accreta 244, 253
- with misoprostol for medical termination of pregnancy 276
- methylethylgometrine, warning on use 66
- Mexico, cost-effectiveness of carbetocin study in 366
- non-pneumatic anti-shock garment studies in 332
- microangiopathy in thrombocytopenia 202–4
- microchimerism 27
- midwife, care after PPH by 551
- debriefing 552
- documentation 551
- management of PPH by 551
- role in PPH prevention 549–51
- training of 552
- mifepristone, description 259
- use in first trimester 286
- use in placenta accreta 259–61
- with misoprostol for medical termination of pregnancy 276
- Millennium Development Goal 5 120, 284
- misoprostol 4, 114, 275–80
- administration route and side-effects 299
- cf conventional oxytocics 279
- cf oxytocin 104, 284, 296
- efficacy 297
- cf placebo/no uterotonic 104
- chemical structure 275
- community-based continuum of care use 556
- cost effectiveness of 541
- costs of 358
- countries in which it is approved for use 70
- deaths averted by 286
- description 259, 275
- efficacy at community level 353
- existing evidence for use of 66
- FIGO guidelines on 609, 612
- for cervical priming 279
- for uterine atony 357
- labor induction 285
- off-label use 284
- overview of studies of its use in PPH 289–95
- pharmacokinetics 275
- plus oxytocin 300
- recommendations for use in PPH 295
- safe dose by gestation 278
- safety 278
- side-effects 276
- sublingual for PPH 296–301
- use after intrauterine fetal death 286
- use by trained birth attendants 284
- use for medical termination of pregnancy 276
- use in first trimester 276, 285
- use in low resource settings 285, 540
- use in out-of-hospital deliveries 573
- use in placenta accreta 259–61
- use in practice 284–7
- use in second trimester 277, 286
- use in third stage of labor 279
- use in third trimester 278, 286
- mobile phone use to distribute reproductive health information 287
- moda, blood loss assessment from 354
- Modified Early Obstetric Warning Scores 74, 75, 359
- morbidity–mortality continuum 500
- morbidly adherent placenta, *see* placenta accreta, placenta increta, placenta percreta
- motor vehicle accidents and abdominal trauma 189–91
- multidisciplinary teams, and reduction of severe acute maternal morbidity 510
- for placenta accreta management 251
- multigate spectral Doppler analysis 89, 90
- multiple gestation, placenta previa risk 231
- PPH incidence 152, 156
- PPH risk 140
- Muskoka initiative 68
- myonecrosis 492

- National Patient Safety Agency recommendations 166
- near misses,  
 cf severe acute maternal morbidity 499  
 determining incidence 147–51
- necrosis at cesarean section scar site 492
- NeoNatalie® newborn simulator 603
- neovascularization,  
 anastomotic levels of 266  
 in placental invasion 265
- Nepal, misoprostol use in 557
- Nigeria,  
 blood loss assessment by moda 354  
 misoprostol use in 286, 287  
 non-pneumatic anti-shock garment trials in 322–7  
 use in 559
- Nitabuch's layer 264
- non-governmental organizations 543
- non-pneumatic anti-shock garment 558  
 application 321  
 description of 318  
 FIGO guidelines on 616  
 for non-atonic PPH 326  
 intra-abdominal pressure and 338  
 manufacture 328  
 mechanisms of action 331–9  
 patient management in 322  
 pelvic blood flow and 337  
 physiologic studies of 335  
 removal 322  
 suggested protocol for use 320  
 trials 318–28  
 for use during transport 327  
 in Mexico 332  
 in Zambia 327, 332  
 in Zimbabwe 327, 332  
 use during transportation 315, 318, 454  
 use in developed countries 328  
 use in Egypt 322–7  
 use in low-resource settings 320  
 use in Nigeria 322–7  
 use in Pakistan 322  
 use with other therapies 327  
 variation in strength of applicators and efficacy 338–9
- noradrenergic receptors 522
- Obstetric Hemorrhage Education Project 348–50
- obstetric hemorrhage equipment tray 314
- obstetric rapid response team 342
- obstructed labor and uterine rupture 188
- one-step conservative surgery for placenta accreta 267–70
- organ-dysfunction approach to maternal near miss 148
- out-of-hospital deliveries 571–4  
 global rates 572  
 planned vs. unplanned 572  
 PPH and 573  
 PPH risk 574
- ovarian arteries, prepregnancy hemodynamics 178
- ovarian vein,  
 diameter decrease after pregnancy 182  
 diameter increase during pregnancy 182
- oxytocin 101–4  
 after successful tamponade 380  
 cf carbetocin 362, 363  
 cf misoprostol 104, 279, 284, 296  
 efficacy 297  
 chemical structure 362  
 FIGO guidelines on use 612  
 for uterine atony 356–7  
 limitations of use 361  
 plus misoprostol 300  
 prophylactic use plus misoprostol 301  
 role in third stage of labor 95  
 side-effects 356  
 synthesis 355  
 use in first stage management and PPH 157  
 use in secondary PPH 469  
 use in third stage of labor 102, 103, 104  
 vs. ergometrine plus oxytocin 103  
 vs. ergot alkaloids 102  
 vs. no uterotonics 102
- oxytocin agonists 102
- packed red blood cells 30
- packing 9  
 for vaginal tears 195  
 in hemostatic resuscitation 25  
 pelvic pressure pack 458–60  
 success of 459  
 uterine 379
- Pakistan,  
 misoprostol use in 557  
 non-pneumatic anti-shock garment trials in 322
- parallel blood flow circuits in uterus 181
- parity,  
 placenta previa risk 231  
 PPH risk 139
- pathology of postpartum uterus 489–97
- pathophysiology,  
 of uterine atony 97  
 of uterine muscle 94
- patient safety teams 342
- patient transfer 5  
 barriers to 559  
 in low resource settings 543  
 non-pneumatic anti-shock garment and 315, 318, 325, 327  
 problems and maternal morbidity and mortality 308  
 reduction of severe acute maternal morbidity and 510
- pelvic anastomoses 442
- pelvic pressure pack 458–60  
 for obstetric hemorrhage equipment tray 315
- pelvic vascular supply 439  
 anatomy on imaging 399–400
- pelvic vessels,  
 abnormal vasculature and secondary PPH 467  
 pelvic artery embolization in placenta accreta 253  
 vascular branching patterns in 399
- perineal tear repair 195
- peripartum hysterectomy 462–64  
 impact of new hospital systems on incidence 346  
 severe acute maternal morbidity after 507
- permanent embolic materials 400
- pharmacokinetics of misoprostol 275
- physiology,  
 adaptations during pregnancy 82  
 of hypovolemic shock 332  
 of internal iliac artery ligation 442
- placenta,  
 abnormal in S1 and S2 segments 22  
 adherent 10  
 guidelines for MRI in 17  
 bipartite 236  
 classical methods of delivery 95  
 examination of 4, 119  
 FIGO guidelines on facilitation of delivery 611  
 growth and maturation of 180  
 guidelines for placental MRI 17  
 invasive pattern of human placentation 56  
 lacunae in and diagnosis of placenta accreta 241  
 lower segment implantation and PPH 97  
 management for abdominal pregnancy 585  
 management of morbidly adherent 163  
 manual removal, EUPHRATES consensus on 111  
 maternal circulation to 180  
 mature 180  
 pathology 496  
 and final blood loss volume 373  
 rare abnormal shapes 236  
 removal in acute uterine inversion 186  
 retained 494  
 retained tissue or membranes 453  
 retention prevalence 138  
 separation and uterine activity 94  
 succenturiate lobe of 236
- placenta accreta 57, 235–6  
 as a cause of consumptive coagulopathy 205  
 balloon catheter placement and embolization in 408  
 compression suture for 436  
 diagnosis 247  
 effect of screening on management in a UK hospital 247–56  
 elective cesarean for 10  
 emergency cesarean for 11  
 fertility after 260  
 imaging of 248–50  
 guidelines for MRI in 17  
 in UK 163  
 incidence 240  
 increasing 247, 263  
 management,  
 algorithm for 243  
 conservative 252  
 conservative leaving placenta in uterus 242  
 conservative with adjuvant therapy 244  
 conservative with resection of placental bed 244  
 emergency 244–5  
 in UK 247–56  
 intraoperative 254  
 multidisciplinary team planning for 251

- of acutely presenting cases 253
- one-step conservative surgery 263–71
- outpatient 251
- postpartum 256
- timing of surgery 267
- using mifepristone/  
misoprostol 259–61
- when diagnosed after delivery 244–5
- when diagnosed antenatally 250
- with hysterectomy 242
- without hysterectomy 242–4
- management of 240–5
- maternal mortality 247
- morphological classification 264
- multidisciplinary team management checklist 254
- operative delivery of infant 255
- pathophysiology of 98
- peripartum hysterectomy and 463
- postoperative thromboprophylaxis 256
- postpartum pathology of 493
- PPH incidence and 156
- pregnancy after 263
- prenatal screening for 240–1
- preoperative checklist 254
- preparation protocols for management 343
- prevalence 138
- recommended protocol for 410
- risk factors 240, 248
- secondary PPH after 466
- surgical management 453
- systems of neovascularization in 266
- topical hemostatic agents for 485
- unexpected diagnosis 11
- placenta increta 235–6
  - balloon catheter placement in 409
  - compression suture for 436
  - prevalence 138
  - recommended protocol for 410
  - secondary PPH after 466
- placenta membranacea 236
- placenta percreta 57, 235–6
  - compression suture for 436
  - one-step conservative surgery 255
  - postpartum pathology of 493
  - prevalence 138
  - recommended protocol for 410
  - secondary PPH after 466
- placenta previa 231–5
  - after cesarean section care bundle 166
  - as risk factor for placenta accreta 240
  - clinical presentation 231
  - compression suture for 434
  - diagnosis 231
    - imaging for 232
  - excessive bleeding at cesarean section and 449
  - grading 231
  - incidence 231
  - management,
    - cesarean section for 234–5
    - expectant 233
    - procedure used 234
  - pathophysiology of 98
  - peripartum hysterectomy and 463
  - placenta accreta risk and 248
  - preparation protocols for management 343
  - risk factors for 231
  - substandard management 163
  - surgical management 453
  - topical hemostatic agents 480
  - use of fibrin sealants in 476
- placental abnormalities 227–36
- placental abruption 57, 227–30
  - after blunt abdominal trauma 190
  - as a cause of consumptive coagulopathy 205
  - concealed cf revealed 228
  - diagnosis 227
  - grading 228
  - incidence 227
  - management,
    - by immediate delivery 229
    - expectant 230
    - of complications 230
  - peripartum hysterectomy and 463
  - risk factors 227, 228
  - substandard management 162
  - tocolytic masking of 191
  - triple tourniquet for 451
- placental invasion description 263–4
- placental lacunae 248
- placental separation mechanics 182
- placental–vesical system (neovascularization) 266
- placentalation,
  - impaired 57
  - invasive pattern in humans cf other primates 56
- plasma,
  - cf cryoprecipitate and fibrinogen 50
  - dose 33
  - for transfusion 32–3
  - volume changes 84
- platelets,
  - congenital platelet disorders 208
  - dose 34
  - for transfusion 33–4
- pneumatic anti-shock garment 318, 319
  - animal studies 333
  - current status of 320
  - human studies 334
  - physiologic studies of 333
  - theoretical model of function 333
- POPPHI 121–3
- postpartum hemorrhage (PPH),
  - accurate rate determination 152–8
  - after elective cesarean section 7
  - after forceps delivery 6
  - algorithm for management of 196
  - autopsy after 496
  - case reports 546–8
  - causes 130–1, 433
  - classification 82, 129–32
  - common scenarios 3–18
  - concealed 13
  - declining mortality in Japan 169–74
  - definition 64, 81, 133
  - early fibrinogen use 45–7
  - etiology 65
  - EUPHRATES definition 109
  - European consensus on prevention and management of 109–12
  - evolution and 55–61
  - history of 545
  - hospital systems for care of 341–7
  - in elective cesarean for adherent placenta 10
  - in failed sequential instrumental delivery/emergency cesarean 9
  - in other animals 58
  - in uterine inversion 15
  - instrumental delivery and 5
  - intensive care management 520–5
  - link with invasive placentation 57
  - litigation after 527–35
  - longstanding history of 60
  - management in low resource settings 539–44
  - management model 24–7
  - management under different scenarios 3–18
  - massive transfusion in 34–7
  - measurement methodologies 65
  - misoprostol therapy 279, 289–95, 296–301
  - modern teaching/learning modalities for PPH management 514–18
  - new approaches to transfusion in 48–51
  - obstetric hemorrhage equipment tray contents 314
  - pathophysiology of 97
  - prevention of 66
    - EUPHRATES consensus on 109–11
    - in UK 166
    - initiatives 67
    - projects in Japan 172
  - progressive intermittent 12
  - secondary 466–71
  - severe acute maternal morbidity 499–511
  - statistics 64
  - transfusion management of 30–41
  - vaginal delivery and 4
  - variations in definition 155
  - vascular malformations and 218–24
  - WHO guidance on prevention 121
- postsurgical packing 458
- post-transfusion purpura 27
- PRactical Obstetric MultiProfessional Training (PROMPT) 565
- pre-eclampsia 57, 82
  - and HELLP syndrome 203
  - and PPH risk 140
  - as a cause of consumptive coagulopathy 205
- pregnancy,
  - after placenta accreta 263
  - changes in coagulation system during 199
  - uterine arteries during 182
- preterm labor after blunt abdominal trauma 190
- prevention initiatives 67
- Prevention of PPH Initiative 121–3
- previous PPH and PPH incidence 156
- professional organizations, role in PPH prevention 67
- progressive intermittent PPH 12
- prolonged pregnancy and PPH risk 140
- prophylaxis,
  - antibiotic use and pelvic packing 460
  - antibiotic use in placenta accreta 252
  - for deep vein thrombosis after placenta accreta surgery 270
  - internal iliac artery ligation for 442

- misoprostol use after prophylactic oxytocin 301  
 non-pneumatic anti-shock garment use in 559  
 thromboprophylaxis in placenta accreta 256  
 use of ergot alkaloids in third stage of labor 104
- prostaglandin,  
   excessive bleeding at cesarean section and 449  
   for uterine atony 358  
   injectable 104  
   isolation of 355  
   *see also* misoprostol  
   use in third stage of labor 96, 104
- pseudoaneurysm 218  
   angiographic proof 222, 223, 471  
   causes 222  
   of uterine artery 13
- pulmonary edema 409  
 pulmonary embolism 356
- pyrexia,  
   misoprostol administration route and 299  
   misoprostol and 289  
   PPH incidence and 156
- quality Doppler profile 91, 92
- re-laparotomy 15
- recombinant activated factor VII 359, 415–28
- recommendations,  
   for non-pneumatic anti-shock garment 318  
   for use of recombinant activated factor VII 427–8  
   global for active management of third stage of labor 120–4  
   of Confidential Enquiry into Maternal and Child Health 166
- recovery area, PPH in 7
- rectum, injuries and ventouse delivery 5
- red blood cells,  
   dose 32  
   for transfusion 30–2
- refusal of care 165
- replenishing lost volume 77
- respiratory distress syndrome and early cord clamping 105
- resuscitation,  
   after secondary PPH 468  
   hemostatic 25  
   non-pneumatic anti-shock garment and 321
- retained placenta 494  
   PPH incidence and 156  
   prevalence 138
- retained products of conception 494
- retractors, for obstetric hemorrhage equipment tray 314–5
- retroperitoneal hematoma 14
- risk factors,  
   for bleeding from lower genital tract 194  
   for placenta accreta 240, 248, 263  
   for placenta previa 231  
   for placental abruption 227, 228  
   for PPH 139–43, 539
- changes in 157  
   classic factors of recent findings 157  
   for secondary PPH 467  
   for severe acute maternal morbidity 505  
   for tamponade test 392  
   for uterine atony 356  
   identification of by midwife 549  
   importance in out-of-hospital deliveries 571  
   increased PPH incidence and 152  
   primary prevention and severe acute maternal morbidity 508
- Royal College of Obstetricians and Gynaecologists (RCOG),  
   guidelines for use of intrauterine balloon 385  
   management recommendations 551  
   standards for prevention and treatment of PPH 166
- rupture, *see* uterine rupture
- rural deliveries, blood loss assessment in 86
- Rüşch hydrostatic urological balloon 378  
   experience in Italy 382
- S1 segment 6  
   abnormal placentation in 22  
   placental invasion 267  
   uterovaginal blood supply 19–23
- S2 segment 6  
   abnormal placentation in 22  
   placental invasion 267  
   segment of uterovaginal blood supply 19–23
- safety,  
   of cell salvage methods in obstetrics 578  
   of fibrin sealants 475  
   of recombinant activated factor VII 419, 427
- scenario teaching 309–10
- Schultze method 95
- sciatica 410
- Scotland,  
   maternal morbidity 136  
   severe acute maternal morbidity in 501, 507
- screening,  
   effect on placenta accreta management in a UK hospital 247–56  
   for morbidly adherent placentas 250  
   for placenta accreta 250  
   prenatal screening for placenta accreta 240–1
- sealants 474–6
- secondary autoimmune thrombocytopenia 201
- secondary PPH 466–71  
   causes 467  
   management 468  
   resuscitation 468  
   risk factors for 467
- Sengstaken–Blakemore tube 378, 381
- sepsis,  
   after tamponade 383  
   as a cause of consumptive coagulopathy 205  
   peripartum hysterectomy and 463
- severe acute maternal morbidity in 504  
   septic transfusion reaction 37  
   severe acute maternal morbidity 147–51, 499–511  
     attributed to hemorrhage 505  
     *cf* near miss 499  
     definition 499  
     identification of 501  
     incidence 501  
     increasing incidence 506  
     main causes 504  
     measures to reduce 508–11  
     mortality and 501  
     outcomes after 508  
     risk factors for 505  
   sexual intercourse avoidance in placenta accreta 251  
   Sheehan syndrome 533  
   shivering and misoprostol 289
- shock,  
   cardiovascular physiology of 332  
   decreased recovery times with non-pneumatic anti-shock garment 323  
   identification of 550  
   in acute uterine inversion 185  
   in placental abruption 230  
   internal iliac artery ligation for 444  
   stages of 74  
   shock index 335
- side-effects,  
   of blood transfusions 587  
   of carbetocin 364, 366  
   of carboprost 357  
   of ergometrine 115, 357  
   of misoprostol 115, 276, 278, 289, 299, 358  
   of oxytocin 299, 356  
   oxytocin lack of 115  
   safety of fibrin sealants 475
- skills teaching 308–9
- sample scenario for PPH due to uterine atony 312
- sample scenario for PPH not due to uterine atony 313
- stations in training 349
- training and reduction of severe acute maternal morbidity 510
- smoking and risk of placenta previa 231
- South Africa,  
   severe acute maternal morbidity in 501, 501
- South America, B-Lynch suture compression suture use in 438
- statistics,  
   first national register of 64  
   for PPH incidence and risk factors 133–43  
   how to measure PPH 65  
   stepwise devascularization 439–40, 452  
   in major PPH 20
- subinvolvement 494  
   secondary PPH after 466
- substandard care 3
- substandard management,  
   of placenta previa 163  
   of placental abruption 162  
   of PPH 163
- sulprostone use in placenta accreta management 244
- supravalvular hematoma 197

- surgery,  
 as a risk factor for placenta previa  
 and accreta 98  
 conservative management 433–40  
 costs of 541  
 for abdominal pregnancy 585  
 for internal iliac artery ligation  
 443–4  
 intraoperative autologous blood  
 transfusions 577–82  
 position of surgeon for internal iliac  
 artery ligation 446  
 postsurgical packing 458  
 use in Jehovah's Witnesses 590  
 use in low resource settings 541  
 suture diagrams 315, 316  
 Sweden, development of national registry  
 of vital statistics 64  
 swiss-cheese placenta 241  
 Syntocinon, *see* oxytocin  
 Syntometrine 103, 114  
 cf carbetocin 363  
 use in secondary PPH 469  
 warning on use 66  
 systemic lupus erythematosus 201  
 systolic blood pressure, relationship with  
 intraluminal pressure 374
- tamponade,  
 algorithm for use of internal uterine  
 balloon 385  
 Belfort–Dildy Obstetrical  
 Tamponade System 460  
 care after successful 379  
 cf hysterectomy 383  
 experience in Italy 381–5  
 FIGO guidelines on 615  
 general principles 377  
 internal uterine 377–80  
 materials for obstetric hemorrhage  
 equipment tray 315  
 pelvic pressure pack 458–60  
 principle of action 381  
 test volume 372  
 using Rüşch hydrostatic urological  
 balloon in Italy 382–5  
 uterine-specific cf non-specific  
 balloons 387
- tamponade algorithm for 390  
 tamponade test 369–75, 377, 381, 388  
 complications 394  
 patient positioning for 393  
 postinsertion observation 395  
 prevention of balloon displacement  
 394  
 removal of balloon and follow-up  
 396  
 risk factors indication of use and  
 insertion 392  
 stages of use 392–6
- Tanzania,  
 MamaNatalie® newborn simulator  
 trials 602  
 misoprostol efficacy at community  
 level in 353  
 severe acute maternal morbidity in  
 501  
 use of kanga to measure blood loss  
 83, 353, 557
- teamwork,  
 cost-effectiveness 565  
 in emergency care 562
- lessons from aviation 562  
 simulations for training of 564  
 teratogenicity, of misoprostol 276, 284  
 termination of pregnancy using  
 misoprostol 285
- The Netherlands,  
 planned home deliveries in 572  
 severe acute maternal morbidity in  
 501
- third stage of labor,  
 active management 101–6  
 definition 113  
 management options for midwife  
 550  
 use of misoprostol in 279
- third stage of labor,  
 pathophysiology of PPH and 94–9  
 role of oxytocin in 95  
 role of prostaglandins in 96
- three-dimensional color power Doppler  
 ultrasound for placenta accreta  
 249
- three-dimensional ultrasound, for placenta  
 accreta 249
- thrombin, prevalence of disorders 139  
 thrombin generation patterns 45  
 thrombocytopenia 199  
 drug-induced 202  
 gestational 200  
 heparin-induced 202  
 HIV-associated 202  
 incidental 200  
 secondary autoimmune 201  
 topical hemostatic agents for 485  
 with microangiopathy 202–4
- thromboelastography 49  
 thromboelastometry 49  
 thromboembolism after embolization  
 410
- thrombogenic bileaflet valves 207  
 thromboprophylaxis in placenta accreta  
 256
- thrombotic thrombocytopenic purpura  
 203
- TISSEEL™ 475, 481–5
- tocolytics and masked abruption 191  
 topical hemostatic agents 480–5  
 bowel obstruction 484  
 development 480  
 indications for 480  
*see also* fibrin sealants
- tourniquets,  
 isthmal 451  
 triple 451
- traditional birth attendants,  
 blood loss assessment by 86  
 interventions used by 60  
 misoprostol efficacy at community  
 level 353  
 role in community-based continuum  
 of care use 556  
 use of kangas in Tanzania to measure  
 blood loss 83, 353, 557  
 use of misoprostol by 284
- training,  
 cost-effectiveness 565  
 courses and workshops 518  
 drills 564  
 for teamwork 562–6  
 hands-on 516  
 knitted uterus for teaching purposes  
 517  
 lecture-based 516
- MamaNatalie® birthing simulator  
 602–3  
 mandatory state-wide in Illinois  
 348  
 methods used 564  
 modern teaching/learning modalities  
 for PPH management  
 514–18  
 of midwives 552  
 simulations 349, 516, 564  
 skills stations 349
- tranexamic acid 4, 36  
 use in PPH 358  
 use in secondary PPH 471
- transfusion,  
 ABO compatibility 31  
 after massive resuscitation 27  
 autologous 577–82  
 use in Jehovah's Witnesses 590  
 blood component administration 38  
 blood transfusion refusal care  
 pathway 595  
 care plan for women in labor  
 refusing blood transfusion  
 597  
 cell salvage methods 578  
 checklist for women in labor  
 refusing blood transfusion  
 599  
 complications of 37–41  
 delay and litigation 530  
 hypotension after cell salvage 581  
 infection after and litigation 529  
 intraoperative autologous blood  
 transfusions 577–82  
 intravenous fluids for volume  
 expansion 78  
 Jehovah's Witnesses and 587–92  
 large volume transfusion protocol  
 349, 350  
 management of obstetric  
 hemorrhage 30–41  
 massive transfusion,  
 complications 27  
 protocols 26  
 new approaches 48–51  
 products for 30–4  
 refusal care pathway 595  
 refusal of blood products by women  
 165  
 use during placenta accreta surgery  
 268  
 use in Japan 171  
 wrong blood and litigation 528
- transfusion-related acute lung injury 27,  
 39, 587
- transfusion-related circulatory overload  
 27, 40
- transfusion-related graft-versus-host  
 disease 27
- transfusion-related immunomodulation  
 27, 587
- transportation,  
 barriers to 559  
 delays and non-pneumatic  
 anti-shock garment use 325  
 in low resource settings 543  
 non-pneumatic anti-shock garment  
 and 315, 318  
 problems and maternal morbidity  
 and mortality 308  
 reduction of severe acute maternal  
 morbidity and 510

- trials for non-pneumatic anti-shock garment use during 327
- trauma 185–91
  - anti-shock garments for 318–20
  - blunt abdominal trauma 189–91
  - prevalence 138
- trial of labor 189
- triple tourniquet technique 451
- trophoblast invasion,
  - patterns of 56
  - placenta previa and 98
  - PPH and 58
  - pre-eclampsia and 57
- trophoblastic disease 495
  
- UK,
  - accurate PPH rate determination 153
  - algorithm for PPH management 167
  - maternal mortality 135
    - from PPH in 162–7
  - placenta accreta management in 247–56
  - severe acute maternal morbidity in England and Scotland 501
  - unplanned home deliveries in 572
  - use of cell salvage methods in 579–80
- ultrasound,
  - abdominal pregnancy diagnosis 584
  - Bakri balloon 375
  - before embolization 406
  - diagnosis of placenta previa by 232
  - Doppler imaging,
    - for placenta accreta 248, 249
    - for vascular malformations 219, 220, 221
  - placenta accreta diagnosis 247, 248
    - prenatal screening for 240–1
  - portable machine 91
  - three-dimensional,
    - color power Doppler for placenta accreta 249
    - for placenta accreta 249
  - vascular supply of pelvis 399–400
- umbilical cord,
  - clamping recommendations 115
  - delayed clamping 118
  - early clamping of 105
  - FIGO guidelines on management 611
  - see also* controlled cord traction
- unlawful practice of medicine 527
- ureter,
  - damage during internal iliac artery ligation 446
  - injury to 5
  - stenting of in placenta accreta 254
- US Agency for International Development, POPPHI 121–3
- USA,
  - accurate PPH rate determination 154
  - B-Lynch suture compression suture use in 438
  - development of hospital systems for PPH in New York 342–7
  - Illinois model of training 348–50
  - maternal morbidity 137
  - maternal mortality 136
  - planned home deliveries in 572
  - severe acute maternal morbidity in 501, 507
    - topical hemostatic agent use in 484
  - uterine activity and placental separation 94
  - uterine anastomotic system 267
  - uterine arteries,
    - anastomosis with vaginal arteries 20
    - bilateral embolization 470
    - blood flow, at term 181
    - branching patterns 399
    - diameter increase during pregnancy 181
    - effect of balloon tamponade on 375
    - embolization in placenta accreta management 244
    - fetal nourishment and 180
    - ligation 452
    - multigate spectral Doppler analysis 90
    - prepregnancy hemodynamics 177
    - pseudoaneurysm 13
    - segmental concept of anatomy 19
  - uterine atony,
    - after elective cesarean section 8
    - approaches to 381
    - Bakri balloon for 387
    - carbetocin for 361
    - carboprost for 357
    - cf vaginal trauma 5
    - community-level management 353
    - embolization and balloon catheter placement 398
    - ergometrine for 357
    - identification 355
    - in vaginal delivery PPH 4
    - intraluminal pressure readings in 369
    - medical therapies 355
    - medical therapy for 355–359
    - misoprostol cf oxytocin for 296
    - misoprostol for 357
    - oxytocin for 356–7
    - pathophysiology of 97
    - peripartum hysterectomy and 463
    - postpartum pathology 495
    - prevalence 138
    - prostaglandins for 358
    - recombinant factor VII 415
    - risk factors for 356
    - S1 bleeding and 6
    - sample scenarios for training 312, 313
    - secondary PPH after 466
    - surgical steps to arrest 451
    - tamponade for 377, 381
    - underlying causes 58
  - uterine blood flow,
    - hemodynamic changes in 89–93
    - quality Doppler profile 91, 92
  - uterine embolization, anatomic reasons for failure 20
  - uterine inversion,
    - hydrostatic repositioning 16
    - manual repositioning 15
    - PPH in 15
  - uterine massage 116, 119
    - FIGO guidelines on 610
    - instruction of mother in self-massage 119
  - uterine muscle,
    - contraction and control of bleeding 95
  - diagrammatic representation at rest and at term 94
  - endocrine mechanisms of control 95
  - mechanical events at delivery 94
  - uterine packing 379
  - uterine rupture 14, 164, 188–9
    - after blunt abdominal trauma 191
    - incidence 189
    - obstructed labor and 188
    - peripartum hysterectomy and 463
    - previous cesarean section and 188
    - severe acute maternal morbidity after 507
  - uterine scarring as a risk factor for placenta previa and accreta 98
  - uterine trauma and peripartum hysterectomy 463
  - uterine vascular malformations 218–24
  - utero-ovarian communicating arteries, prepregnancy hemodynamics 179
  - uteroplacental vasculature 489
  - uterotonic agents 101–5
  - uterotonic therapies 359
  - uterotonics,
    - administration and choices of 114
    - cf tamponade 388
    - choice of 4
    - community-based continuum of care use 556
    - cost of 115
    - ergot alkaloids 355
    - EUPHRATES consensus on 110
    - FIGO guidelines on 609
    - first-line 372, 388
    - in placenta accreta management 255
    - recommendations for administration 361
    - use in secondary PPH 469
  - uterovaginal balloon system 458–60
  - uterovaginal blood supply 19–23
  - uterus,
    - abnormal vasculature and secondary PPH 467
    - acute inversion of 185–8
    - arteriovenous malformations of 495
    - bimanual compression of 434
    - bleeding from during cesarean section 448
    - bleeding from uterine incision at cesarean section 449
    - chronic inversion of 188
    - collateral arteries 179
    - evacuation for secondary PPH 469
    - extrinsic arteries 178
    - FIGO guidelines on bimanual compression 613
    - hemodynamic changes during pregnancy 177–83
    - intrinsic arteries 179
    - knitted model for teaching purposes 517
    - lower segment, postpartum pathology of 491–3
    - parallel blood flow circuits in 181
    - postpartum 489–97
    - resection after placenta accreta surgery 269
    - stepwise devascularization of 439–40
    - stretching of cavity by Bakri balloon 375
    - subinvolution 494

- wall structure and compliance with tamponade 374
- vagina,
  - bleeding from lower genital tract 193–8
  - examination for trauma 4, 5
- vaginal arteries, anastomoses with uterine arteries 20
- vaginal delivery,
  - carbetocin use at 363
  - European consensus on prevention and management of PPH at 110
  - hysterotomy for compression suture after 436
  - PPH incidence 156
  - PPH scenario 4
- vaginal hematoma, topical hemostatic agents for 485
- vaginal trauma,
  - after ventouse delivery 5
  - as cause of PPH 4
  - prevalence 138
  - repair 195
  - secondary PPH after 466
- variant Creutzfeldt–Jakob disease 587
- vascular malformations,
  - clinical presentation 219
  - diagnosis 219
  - management 220
  - PPH and 218–24
  - prevention of 222
  - types 218
- vasopressors 522
- venous thromboembolism, anticoagulant therapy during pregnancy and peripartum 206–8
- ventilation,
  - invasive 521
  - non-invasive 521
- ventouse delivery,
  - incorrect cup placement 6
  - PPH scenario 5
  - related lacerations 5
- vesicouterine system (neovascularization) 266
- visual assessment of PPH 71, 82
- visual estimation of blood loss 71, 134
- vitamin K metabolism deficiency 214
- volume deficit classification 130
- volume overload 40
- volume resuscitation 45
- von Willebrand disease 96, 208–10 and PPH risk 140
- in secondary PPH 467, 471
- warfarin 207
- WHO,
  - guidance on management of third stage of labor 121
  - modern teaching/learning modalities for PPH management 514
  - recommendations 118
  - terminology for near misses 147
  - terminology for severe acute maternal morbidity 504
- World Maternal Antifibrinolytic Trial 359
- wound dehiscence and secondary PPH 467
- Zambia,
  - blood loss assessment by chittengue 354
  - non-pneumatic anti-shock garment trials in 327, 332
- Zanzibar, MamaNatalie® newborn simulator trials 603
- Zimbabwe, non-pneumatic anti-shock garment trials in 327, 332