

General Practice Doctors Bag and Emergency Bag Audit – A Quality Improvement Project (QIP) in a Rural Irish General Practice

William Hutch¹, Brendan Payne², Mark Henderson², Breda Looney-Herlihy², Sheila Tarrant², Catherine Gillman²

¹The Department of General Practice, University College Cork, Cork, Ireland; ²Woodbrook Family Practice, Newmarket, Co, Cork, Ireland

Correspondence: William Hutch, The Department of General Practice, University College Cork, Cork, Ireland, Tel +353 21 4632288, Email w.hutch@ucc.ie



Background: Rural general practitioners are typically located far from secondary care. As a result, they have to be able to manage many clinical presentations. One pivotal component is the doctor's bag and emergency bag.

Aim: To audit the doctor's bag and emergency bag contents of suitable documentation, equipment and medications against standardised checklists. To create an online resource to monitor these contents.

Methods: A list of medications, documentation and equipment in the practice doctors' bag and emergency bag was undertaken. This was compared to a standardised checklist. An online intervention tool, the "Ampoule App", allowed users to identify contents and expired items for each bag. The reaudit cycle allowed for replacement of outdated items based on the apps expiration dates.

Results: The exact equipment, medications and documentation for our practice doctors' bag and emergency bag were identified. The quantity and expiration dates of items were recorded. Fifty-eight out of 315 items had expired. These were replaced and this information was uploaded to the Ampoule App. Education and engagement with the app alerted users as to when a medication is due to expire in the future, therefore allowing adequate time to replace items.

Conclusion: There was a desirable improvement in the contents of the doctor's bag and emergency bag post intervention using the Ampoule App and re-education. This audit has led to an increased awareness of what we as GPs carry in our bags daily and how we prepare to deal with multiple medical presentations.

Keywords: general practice, doctors bag, emergency bag, Ampoule App, audit

Introduction

We live in a world that is complex and unpredictable, where even medical experts at times struggle to optimise care. However, the simplest of techniques such as a checklist can lead to immediate improvements.¹ Such checklists are implemented in hospitals around the world helping doctors and health-care workers respond to routine surgical cases to more recent global pandemics such as the covid 19.²

As general practitioners (GPs), we too can use checklists. Rural general practitioners are typically located far from secondary care. The speed at which emergency services can attend is often be limited, such as by air ambulance or by land. Also, when on duty, at weekends and nights, there is a limited number of pharmacies open and therefore, a GP should be prepared to have an adequate amount of medication on hand if required. As a result, they must be able to manage many clinical presentations from non-acute to acute care. One such method of optimising this care is dependent on the choice of equipment, documentation, and medications that they have on hand, particularly if working out of hours. One pivotal component to this is the doctor's bag and its contents.

According to the Irish College of General Practitioners (ICGP), GPs and GP registrars "should have a fully equipped bag for use on house calls or emergency calls".³ The ICGP highlight that the information provided for their doctor's bag

and emergency bag is advisory and such, advice is intended to be used to aid doctors in their choice of bag and equipment setup. They provide a basic template of what is included. It notes that, what is carried by each individual doctor is a matter of personal choice and will vary depending on one's needs such a rural or urban practice.

A report published by the Primary Care Quality and Information Service of Wales, 2012, outlines “what is the minimum extent and range of items that are likely to be of genuine value in providing emergency and urgent care outside the practice”.⁴ They stress that it needs to be practical and highlight that it must be up to date using a robust method using an inventory such as a checklist to allow for restocking. Ideally, this checklist should be easy to use so that GPs will be able to record what was used and replace items in a simple systematic manner.

It is hoped that this audit will provide useful information for both GPs and new GP registrars when reviewing the contents of their own medical bag and emergency bag. In addition, the contents of each bag are outlined including documentation, equipment and medications that are suitable for practice when on duty, with particular emphasis on practice in a rural setting.

Aims

The following aims are:

1. To audit our practice doctors' bag and emergency bag contents of suitable documentation, equipment and medications against standardised checklists so as to optimise the GP's ability to manage urgent and non-urgent situations in a rural Irish setting.
2. To create an online resource to monitor these contents. Therefore, allowing adequate time to replace items that may have expired.

Methods

This audit was undertaken at Woodbrook Family Practice, Newmarket, Co. Cork, Ireland from 01/09/19 to 01/05/2020.

This audit was exempt from review and ethical approval by the Cork General Practice Training Scheme because it was a non-interventional study (ie, an audit of the doctor's bag and emergency bag contents only) and no subjects were involved.

Prior to starting this audit, in discussion with the practice staff, we agreed the choice of medication and equipment over a two-week period from 01/09/19 to 14/09/19 that would be most suitable to be included in a doctor's bag and emergency bag for a rural setting. We agreed to use the Primary Care Quality and Information Service of Wales, 2012 audit as a template, along with the ICGP guidelines, and this study's guideline bag contents are reproduced in the result tables (Tables 1–4).^{3,4} Based on these audits, the ideal number of bags to have is two, that is a doctors bag and a “trauma bag”/Emergency bag.

Round one of the audit (16/09/19 to 04/10/19) set out to record the current content of our doctors bag and emergency bag. A systematic checklist was undertaken by each of the authors as follows:

- (a) Cataloguing the items of equipment and medications against a standardised list.^{3,4}
- (b) For each medication: name of medication, quantity, and expiration dates.
- (c) For IM injections/Ampoules quantity and expiration dates were recorded.
- (d) Documentation– As a practice, we agreed the choice of appropriate documentation.

Round two of audit (08/10/19 to 01/03/20): The doctor's bag and emergency bag contents were checked by two authors (WH, BP & BLH) against the standardised checklists.^{3,4} On review of the checklists, if ambiguity regarding inclusion/exclusion of an item, for example such as a medication like an antibiotic, the authors WH, BP and BLH consulted local guidelines before including/excluding any items.⁵ Based on this intervention, expired items were ordered, and an up-to-date catalogue was created.

Table 1 Doctors Bag and Its Contents

Diagnostic Equipment	Quantity
Thermometer	1
Sphygmomanometer	1
SpO2 pulse oximeter	1
Wristwatch to aid recording heart rate/ Respiratory rate	1
Urine analysis/multistix	20
Glucometer kit and Sterile Lancets	1
Scissors	1
Auroscope/ophthalmoscope	1
Head torch and AAA Batteries	1
Tongue depressors (wrapped)	10
Reflex Hammer	1
Alcohol gel for hands	1
Wipes, gloves, face mask	5 each
Peak flow meter	1
Specimen bottles (urine, feaces) and swabs	4 each
Small sharps box	1
Tourniquet	1
Selection of syringes (1mL, 5mL, 10mL) and needles	4 each
Tape	1
Blue butterfly	4
Orange butterfly	4
Tegaderm small	4
Tegaderm Film large	4
Sterile Swabs	4
Plasters	10
Cotton wool ball	10
IV needles (Yellow 24G, Blue 22G, Green 18G)	4 each
IV extension set	4
Water for injection and syringe	4 each
5mL spoon	1

Once round two of the audit was complete, this allowed for the most up-to-date content to be upload to the “Ampoule App”. This App allows for real time monitoring for all the doctor’s bag contents. It provides a fast, easily accessible checklist that will alert the doctor when any medication expires and therefore can be replaced in time.

Table 2 Doctors Bag – Medication Inventory and Expiration Dates

Medication	Amount	Expiry Date
Analgesia		
Paracetamol 500mg tablets	50	09/2020
Ibuprofen 400mg tablets	12	07/2020
Codeine 30mg/Paracetamol 500mg (Solpadol) tablets	10	10/2021
Tramadol 50mg tablets	40	12/2021
Diclofenac 50mg tablets	28	10/2020
Diclofenac sodium 25mg/mL 3mL ampoules	4	10/2020
Diclofenac 100mg suppositories	5	11/2020
Diamorphine 2.5–10mg injection	2	04/2020
Anaphylaxis		
Chlorphenamine 10mg/mL injection	5	02/2022
Adrenaline 1:1000 injection (1mg/mL)	10	09/2020
Antibiotics/ Antimicrobials		
Benzylpenicillin 600mg vials (x^2) for reconstitution with water for injection or sodium chloride	2	11/2020
Ceftriaxone (Rocephin) 1 g injection	3	09/2020
Co-amoxiclav (Augmentin) 625mg tablets	14	06/2020
Co-amoxiclav (Augmentin) 375mg tablets	7	03/2021
Doxycycline 100mg tablets	5	06/2021
Clarithromycin (Klacid) 250mg tablets	7	06/2020
Trimethoprim 200mg tablets	5	06/2020
Doxycycline 50mg tablets	7	10/2020
Ciprofloxacin 250mg tablets	7	09/2022
Flucloxacillin 250mg tablets	7	08/2022
Antiemetics		
Prochlorperazine (Stemetil) 5mg tablets	10	09/2020
Prochlorperazine (Stemetil) 12.5mg/mL injection	7	01/2021
Cyclizine (Valoid) 50mg tablets	7	10/2022
Cyclizine (Valoid) 50mg/mL	7	10/2020
Metoclopramide 10mg tablets	7	10/2020
Betahistine (Serc) 16mg tablets	21	04/2021

(Continued)

Table 2 (Continued).

Medication	Amount	Expiry Date
Asthma		
Salbutamol 100mcg/dose MDI with large volume spacer	1	09/2020
Prednisolone 5mg tablets	30	07/2020
Diabetes/ Blood Glucose		
GlucoGel	1	12/2020
Glucose 20% injection 50mL (given slowly into a large vein through a large-gauge needle)	4	08/2022
Cardiac		
Aspirin (Dispirin) 300mg tablets	2	09/2020
Clopidogrel (Plavix) 75mg tablets	7	06/2020
Glycerine Trinitrate Spray (GTN) 400mcg spray	2	06/2022
Atropine 600micrograms/mL injection	10	08/2020
Ticagrelor 90mg tablets	10	02/2022
Acute left ventricular failure		
Furosemide 20mg tablets	10	09/2020
Psychiatric		
Quetiapine 25mg tablets	4	02/2022
Haloperidol 5mg tablet	5	11/2021
Haloperidol 5mg/mL injection	1	09/2021
Chlordiazepoxide (Librium) 5mg liquid	1	05/2021
Postpartum hemorrhage		
Syntometrine (Ergometrine maleate 500mcg plus oxytocin 5units/mL injection)	1	03/2020
Palliative Care		
Hyoscine butylbromide (Buscopan) 20mg/mL injection	5	12/2020
Hyoscine Hydrobromide 600mcg	3	06/2021
Midazolam 2mg/mL injection	2	03/2024
Diluents		
Water for injection	10	08/2022
Sodium Chloride injection 0.9%	2	02/2022

(Continued)

Table 2 (Continued).

Medication	Amount	Expiry Date
Ophthalmology		
Fluorescein eye drop	10	07/2020
Tetracaine eye drop	10	05/2020
Fucithalamic eye drops	2	06/2022
Opticlude eye patch	10	06/2024
Gastrointestinal medications		
Alverine citrate (Spasmonal forte) 120mg tablets	20	01/2021
Hyoscine butylbromide (Buscopan) 20mg tablets	5	12/2020
Domperidone (Motilium) 10mg tablets	100	02/2022
Lomotil 2.5mg tablets	20	08/2022
Sucralfate (Antepsin) 1g/5mL oral suspension	5	04/2024
Seizures		
Diazepam rectal solution (stesolid) 10mg in 5mL	2	02/2022
Diazepam rectal solution (stesolid) 5mg in 2.5mL	2	08/2020
Midazolam oromucosal solution 5mg/mL	1	01/2021
Pediatrics Analgesia		
Paracetamol 120mg/5mL oral suspension	1	06/2020
Paracetamol 60mg, 120mg, 250mg suppositories	1 each	02/2021
Ibuprofen 100mg/5mL oral suspension	1	05/2021
Ibuprofen 200mg tablets	1	06/2020
Pediatric Croup/ Asthma		
Prednisolone 5mg soluble tablets	30	07/2021
Salbutamol 100mcg via spacer	1	07/2020
Salbutamol nebules 2.5mg, 5mg	5 each	09/2020
Ipratropium Bromide nebules 250mcg/mL	7	10/2020
Allergy		
Montelukast 10mg	7	04/2021
Montelukast granules 4mg	2	03/2022
Pediatric Oral Rehydration		
Oral Rehydration salts (Dioralyte) sachets	4	12/2020

Results

A systematic checklist of medications and equipment in the doctor's bag and emergency bag were recorded and the findings of round 2 of the audit is presented. Please see [Tables 1–4](#).

Table 3 Documentation/Multi-Organiser Folder Contents

Documentation	Quantity
Pro/Formas	
Local Injuries Unit referral form	10
General referral form	10
Out of Hours/ South doc referral form	10
Practice headed paper (Woodbrook) referral	10
Injuries diagram referral form	10
Medical certificate	10
Stationary	
Clipboard	1
Envelopes	10
General Medical Scheme Special Type Consultations forms	10
A5 paper for prescriptions	10
Out of hours prescriptions	10
Blood forms	10

Table 4 Emergency Procedures Bag

Emergency Procedures Bag		
Item	Amount	Expiry Date
Urological procedures		
Catheterisation Pack	2	12/2020
Syringe 10mL	4	06/2021
Water for injection 10mL	4	12/2020
U - Bag	2	08/2020
Gloves	2	No expiration date
Emergency wound care		
Dressing Pack (Rociale)	2	03/2022
Syringe 10mL	4	04/2021
Water for injection 10mL	4	08/2020
Disposable scalpel	1	07/2020
Adaptic Digit	1	02/2020
Jelonet	4	No expiration date
Steri - Strip	5	No expiration date

(Continued)

Table 4 (Continued).

Emergency Procedures Bag		
Item	Amount	Expiry Date
Adaptic	2	No expiration date
Tegaderm - film	6	No expiration date
Mepore small	1	No expiration date
Mepore medium	2	No expiration date
Mepore large	1	No expiration date
Tape	1	No expiration date
Bandage	1	No expiration date
Heal Seals	1	08/2020
Bronze fine suture pack	1	01/2021
Meningitis -Pack		
Emergency Meningitis Case & Labelled		No expiration date
Benzylpenicillin 600mg vials (x ²) for reconstitution with water for injection or sodium chloride	2	11/2020
Ceftriaxone (Rocephin) 1 g injection	14	06/2020
Water for injection 10mL	4	08/2020
Sodium Chloride for injection 10mL	2	07/2020
Green needles	4	06/2020
Syringe 10mL	2	06/2020
Steri -swabs	10	06/2021
Eye - Pack		
Fluorescein eye drop	2	07/2020
Tetracaine eye drop	1	05/2020
Fucithalmic eye drops	2	06/2022
Opticlude eye patch	10	06/2024
Tape 2.5cm x 5m	1	No expiration date
Eyepad 8cm x 6cm	4	No expiration date
Opticlude eye patch	4	01/2022
Cotton Buds	10	No expiration date
Seizure Pack		
Diazepam rectal solution (stesolid) 10mg in 5mL	2	02/2022
Diazepam rectal solution (stesolid) 5mg in 2.5mL	2	08/2020
Midazolam oromucosal solution 5mg/mL	1	01/2021

(Continued)

Table 4 (Continued).

Emergency Procedures Bag		
Item	Amount	Expiry Date
Intranasal mucosal device/ Mucosal Atomiser Device (MAD)	1	No expiration date
Cardiac Pack		
Aspirin (Dispirin) 300mg tablets	2	09/2020
Clopidogrel (Plavix) 75mg tablets	7	06/2020
Glycerine Trinitrate Spray (GTN) 400mcg spray	2	06/2022
Atropine 600micrograms/mL injection	10	08/2020
Ticagrelor 90mg tablets	10	02/2022
Morphine 1mg/ mL injection	1	06/2020
Green Needles 21g	2	No expiration date
Syringe 2mL	2	No expiration date
Anaphylaxis pack		
Chlorphenamine 10mg/mL injection	5	02/2022
Adrenaline 1:1000 injection (1mg/mL)	10	09/2020
Green Needles 21g	5	No expiration date
Syringe 10mL	1	No expiration date
ENT pack		
Rapid Rhino	1	01/2022
Dressing Pack	1	03/2022
Res Q – Vac Aspirator	1	No expiration date
Fluids/ IV Line pack		
Sodium Chloride 100mL	2	02/2022
IV extension set (Perfusend – n)	1	01/2021
Sodium Chloride 500mL	2	07/2020
Selection of syringes (1mL, 5mL, 10mL) and needles	5 each	No expiration date
Tape	1	No expiration date
Tegaderm small	1	No expiration date
Tegaderm Film large	1	No expiration date
Sterile Swabs	10	No expiration date
Plasters	10	No expiration date
Cotton wool ball	10	No expiration date
IV needles (Yellow 24G, Blue 22G, Green 18G)	5 each	No expiration date
Tourniquet	1	No expiration date

(Continued)

Table 4 (Continued).

Emergency Procedures Bag		
Item	Amount	Expiry Date
Water for injection and syringe	10	No expiration date
EZ – IO Intraosseous Infusion System [Driver/ Anchor DSG/ tubing]	1	No expiration date
Diabetes/ Blood Glucose - Pack		
GlucoGel	1	12/2020
Glucose 20% injection 50mL (given slowly into a large vein through a large-gauge needle)	4	08/2022
Glucose 5% 500mL	2	12/2021
Resuscitation medications		
Algorithm Rescue sheet	1	Review yearly against up to date guidelines [5]
Adrenaline 1:1000 injection (1mg/mL)	10	09/2020
Atropine 600micrograms/mL injection	08	10/2020
Airway management		
Alcohol Swabs	1	09/2020
C02 detection	1	No expiration date
I gel size 3, 4, 5	1 each	No expiration date
Guedel Airways size 5, 5.5, 6.5, 8, 9, 10	1 each	No expiration date
Nasopharyngeal tubes size 6, 7, 8, 9	1 each	No expiration date
Paediatric Bag Valve Mask (BVM)	1	No expiration date
Adult B.V.M	1	No expiration date
O2 Tubing	2	No expiration date
Paediatric rebreathable O2mask, bag, tubing	1	No expiration date
Adult rebreathable O2mask, bag, tubing	1	No expiration date
Adult nebuliser mask and Tubing	1	No expiration date
Portex Emergency Cricothyroidotomy kit	1	No expiration date
Thomas tube holder	1	No expiration date
Asherman chest seal	1	No expiration date
Intubation Bag		No expiration date
Laryngoscope + 4 curved blades + straight	1	No expiration date
Spare batteries	2	03/2024
Laryngeal Mask Airway (soft seal) size 1.5, 3, 4, 5	1 each	No expiration date

(Continued)

Table 4 (Continued).

Emergency Procedures Bag		
Item	Amount	Expiry Date
Tongue forceps	1	No expiration date
15mm fibreoptic bronchoscope swivel	1	No expiration date
Tracheal tube introducer, size 5.5, 6.5, 7, 7.5, 8, 8.5, 9	1 each	No expiration date
Easyfix 5cm	2	No expiration date
Easyfix 10cm	2	No expiration date
Crepe 10cm	2	No expiration date
Space blanket	1	No expiration date
Paediatric Intubation Bag		
EL tubes size 1, 2, 3, 4	1 each	No expiration date
Laryngeal Mask Airway (soft seal)	1	No expiration date
Portex intubation stylet - small	1	No expiration date
Thomas tube holder	1	No expiration date
Paediatric silicone face mask size 2	1	No expiration date
Disposable bone injection gun 18g paediatric	1	No expiration date

The initial audit found 58 out of 315 items had expired. These items were replaced with the quantity and expiration dates included as outlined in [Tables 2 and 3](#) as part of the reaudit cycle. This ensured that all items in the doctor's bag and emergency bag are in date and recorded. In addition, the initial list of items was reduced to 199 items outlined above as these were chosen to be more in line with other previous studies and our needs in rural general practice.^{3,4}

The second intervention of this reaudit cycle was to enter this data into the Ampoule App. The "Ampoule App" was downloaded to iPhone and iPad. The above information from the doctor's bag and emergency bag was manually entered only after this reaudit cycle had been undertaken. The authors agreed that it was more suitable to manually the items into the ampoule app at this stage as once populated the app would act as an online tool to monitor the most up-to-date doctors' bag and emergency bag contents going forward. Such information was color coded based on the following: The medication/equipment, dose, and its units of measurement, whether it was a tablet, ampoule, syringe. It also included essential batch information if applicable. The expiration dates were entered, and such dates show how many days are left before expiration. All medications and equipment are up to date in the online Ampoule App and cross referenced against the hard copy above. Now both hard copies and online copies exist.

The final part of this Audit involved training practice staff on how to interpret the Ampoule App, therefore allowing them to monitor and order new medication/equipment based on expiration dates.

Discussion

This audit showed a significant improvement in the contents of the doctor's bag and emergency bag post intervention. The implementation of such checklists as outlined in our results has led to an increased awareness of what we as GPs carry in our bags daily and how we prepare to deal with multiple medical presentations.

This audit demonstrates the importance of simple checklists in the wider care of patients for GPs. GPs are extremely hardworking, highly trained, skilled and on a daily basis deal with numerous uncertainties from multiple presentations.

As a result, GPs are at higher risks of error. Avoidable failures are not just a feature of general practice but also in other areas of high complexity, for example such as the aviation industry.^{6,7} The reason for such avoidable errors is evident from the volume, complexity, and capacity that GPs deal with daily.⁶ Such failure can impact a GP's health, along with their practice and their private lives. One such strategy for overcoming failure, is to take advantage of where other industries such as the aviation industry succeeded by applying simple checklists that prepare, plan, and implement standard operating procedures.

The simple checklist from our results led to the development of this audit to optimise what we as GPs carry in our bags daily and how we are to be prepared to deal with medical uncertainties in our day-to-day working lives as GPs. Furthermore, the use and implantation of the Ampoule App and the attached hard copy checklists led to an agreed practice protocol as to what are the contents of the doctor's bag and emergency bag for our practice in a rural setting. This can be also used for an urban GP setting.

The advantage of the audit is that it can be used to change practice at a national and international level. GPs can replicate our checklists outlined along with using the Ampoule App. This saves time recording the appropriate doctors bag and emergency bag contents while also improving reliability. Moreover, it allows GPs to have an up-to-date record of contents that can be monitored in real time.

The disadvantages are that for GPs, the doctors bag contents to date have been tedious to record and monitor. In rural settings, the doctor typically must have a large quantity of equipment and medication on hand to deal with numerous presentations. This can be very time consuming and onerous for GPs. This audit checklist findings and with the use of the online App will allow GPs to overcome this difficulty in the future. A disadvantage of the Ampoule App is that its software functionality is very basic and can be time consuming to input the data. As there is no desktop version, it took a considerable amount of time to input the data into the app. Moreover, the app did not have great versatility for allowing recoding of equipment/medication per say disease type. For example, it would be beneficial to group medications under headings such as analgesia, as outlined in the results section.

Due to the app disadvantages as outlined, this led to the generation of a new idea for a future research project for the doctor's bag. We have begun to develop an online resource (www.GPbag.ie and an app: GP bag) based on this audit, to enable GPs/GP registrars to use real-time checklists and educational material on what is required for a doctor/GP bag. This will allow them to monitor their bag contents of medications/equipment online, via a new more versatile app, with desktop compatibility. This website will be a digital resource where GPs can log into to check their equipment against other standardised virtual bags. This will also provide new GP registrars with itemised lists of medications that they may choose to carry along with equipment.

Conclusion

There was a desirable improvement in the contents of the doctor's bag and emergency bag post intervention and re-education. This quality improvement project has led to an increased awareness of what we as GPs carry in our bags daily. Further investigations implementing this study's doctor's bag and emergency bag checklists, along with the ampoule app may assist GPs to optimise care from urgent to non-urgent medical presentations.

Disclosure

The authors report no conflicts of interest in this work.

References

1. Gawande A. *The Checklist Manifesto*. Metropolitan Books of Henry Hold and Company LLC; 2010.
2. World Health Organization. The safe surgery checklist; 2009. Available from: <https://www.who.int/patientsafety/safesurgery/checklist/en/>. Accessed September 14, 2019.
3. O' Ciartha D. *GP Registrar Handbook: A Guide for GP Registrars*. 2nd ed. ICGP Publishing; 2006.
4. Primary Care Quality and Information Service of Wales. General medical doctors bag audit. PHW document database (primary care quality and information service); 2012. Available from <https://phw.nhs.wales/services-and-teams/harp/urinary-tract-infection-uti-resources-and-tools/uti-accordian/audit-quality-improvement-tools/>. Accessed September 2, 2019.
5. Health Service Executive (HSE). Antibiotic prescribing guidelines. Available form <https://www.hse.ie/eng/services/list/2/gp/antibiotic-prescribing/>. Accessed April 18, 2020.

6. Kapur N, Parand A, Soukup T, et al. Aviation and healthcare: a comparative review with implications for patient safety. *JRSM Open*. 2015;7(1):2054270415616548. doi:10.1177/2054270415616548
7. Aerden D, Smets D, Poelaert J, et al. Fighting human error: what surgeons can learn from aviators. *Acta Chir Belg*. 2014;114(4):228–232. doi:10.1080/00015458.2014.11681017

Clinical Audit

Dovepress

Publish your work in this journal

Clinical Audit is an international, peer-reviewed, open access journal focusing on the processes and outcomes of clinical audit in any area of healthcare. All aspects of patient care are addressed within the journal and practitioners from all disciplines are invited to submit their work. Areas covered include: Publication of audits; How an audit has changed practice; Practical tips on how to do audits and to avoid pitfalls; How audits have changed patient care; Calls and justifications for new audits. The manuscript management system is completely online and includes a very quick and fair peer-review system, which is all easy to use. Visit <http://www.dovepress.com/testimonials.php> to read real quotes from published authors.

Submit your manuscript here: <https://www.dovepress.com/clinical-audit-journal>