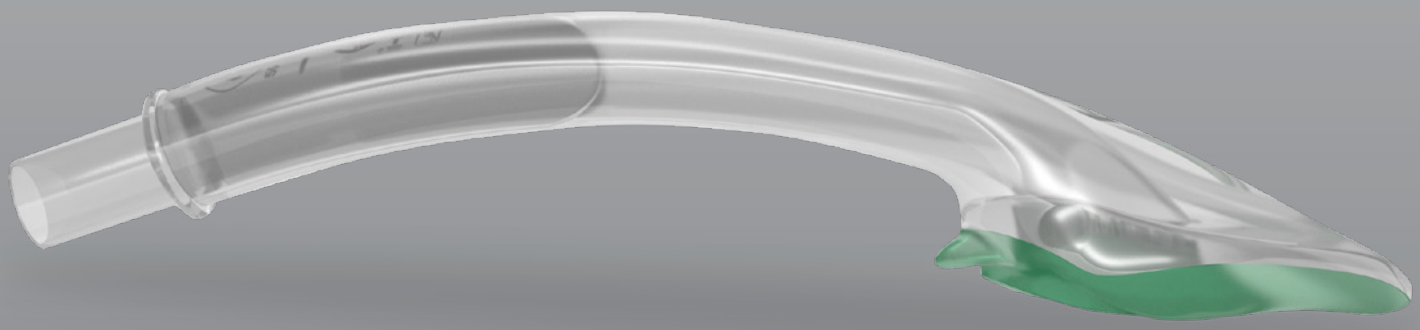
i-gel®

Resuscitation and Emergency Medicine

BIBLIOGRAPHY

Published studies, case reports and correspondence



Volume 1, Issue 2 January 2019

Introduction

The i-gel® is a second generation supraglottic airway, made of a medical grade thermoplastic elastomer, designed to create a non-inflatable anatomical seal of the pharyngeal, laryngeal and perilaryngeal structures. An integrated gastric channel provides an early warning of regurgitation, facilitates venting of gas from the stomach and allows for the passing of a suction tube to empty the stomach contents. The device also includes a buccal cavity stabiliser to provide vertical strength during insertion and eliminate the potential for rotation.

The first study on i-gel was conducted by Richard Levitan and his team at the University of Maryland Medical Center in Baltimore, USA. This landmark study on the positioning and mechanics of i-gel in 65 non-embalmed cadavers, was initially presented as a free paper at the UK Difficult Airway Society meeting in Leicester in November 2004 and accepted for publication in *Anaesthesia* in April 2005. i-gel was subsequently launched in January 2007 at the Association of Anaesthetists of Great Britain and Ireland Winter Meeting in London, UK.

The first independent clinical data on patients was a letter to the editor of *Resuscitation* from David Gabbott and Richard Beringer at Gloucester Royal Hospital in the UK. This correspondence, entitled, 'The i-gel supraglottic airway: A potential role for resuscitation' reported initial findings on the use of i-gel in 100 patients presenting for elective surgery under general anaesthesia.

Since the publication of this letter, i-gel has been the subject of over 150 peer reviewed clinical studies, case reports and correspondence.

A bibliography including all known data on the device was issued in 2011. Since then numerous additional studies have been published and this led to a second edition of the bibliography, updated to include all new data, being issued in 2014.

As we often receive enquiries about clinical data specifically related to the use of the device in the emergency medicine setting and during resuscitation of patients in cardiac arrest, we felt there would be value in producing a more streamlined bibliography, focusing on this particular area of potential use.

This bibliography includes general reviews regarding airway management for resuscitation, particularly those related to use of airway devices for out-of-hospital cardiac arrest (OHCA), as well as those studies specifically evaluating use of i-gel in an emergency medicine or resuscitation setting.

There is also a section relating to use of cardiocerebral resuscitation (CCR) incorporating passive oxygenation (PO). Although these studies do not include i-gel, as the i-gel O_2 incorporates a supplementary oxygen port which can be used for the delivery of passive oxygenation, we thought they might be of interest. It should be noted that the 2010 European Resuscitation Council Guidelines for Resuscitation do not recommend passive oxygen delivery without ventilation for routine use during CPR[1].

Each study listed includes a brief summary description. These summaries are not intended to provide a comprehensive overview of the study concerned, only to assist the reader in deciding whether a particular paper is relevant to their area of interest, prior to obtaining a copy of the full document for review. The bibliography also provides an index by first author and journal title.

Titles are taken from the articles as they appear in their original form, spelling variations included, allowing you to make a perfectly accurate internet search should you wish to find out more.

Every attempt has been made to include all known data relevant to use of i-gel in the emergency medicine and resuscitation setting, irrespective of outcome, so as to allow the reader every opportunity to obtain a balanced overview of the clinical data that exists for i-gel. However, the nature of such a document is that it inevitably becomes out of date as soon as it is published, so we intend to issue updated versions at regular intervals.

Whilst every attempt has been made to provide accurate information, we apologise in advance for any errors or omissions and will be pleased to make any corrections brought to our notice in any following edition. We hope you find this bibliography interesting and useful.

1 Deakin CD, Nolan JP, Soar J, Sunde K, Koster RW, Smith GB, Perkins GD. European Resuscitation Council Guidelines for Resuscitation 2010 Section 4. Adult advanced life support. Resuscitation 2010; 81(10): 1305-52

Contents

Studies

Clinical

Randomised comparison of the effectiveness of the laryngeal mask airway supreme, i-gel and current practice in the initial airway management of prehospital cardiac arrest (REVIVE-Airways): a feasibility study research protocol

Benger J R, Voss S, Coates D, Greenwood R, Nolan J, Rawstorne S, Rhys M, Thomas M. BMJ Open 2013; 3: e002467

An investigative study into the proposal by JRCALC that supraglottic airway devices are safe and effective devices for use in OHCA. In the form of a cluster, randomised trial design, comparisons of LMA Supreme and the i-gel® will be carried out against each other and current practices. Objectives will be success during initial airway management, ventilation success, whether other interventions are required, airway integrity on arrival at hospital, and numerous stages of patient survival.

Higher insertion success with the i-gel® supraglottic airway in out-of-hospital cardiac arrest: A randomised controlled trial

Middleton PM, Simpson PM, Thomas RE, Bendall JC. Resuscitation 2014; 85(7): 893-7

Single-centre, prospective parallel-group randomised controlled trial (RCT) in subjects with an out-of-hospital cardiac arrest, with patients allocated to two groups: i-gel® and Portex® Soft Seal® Laryngeal Mask. Total of 51 patients were randomised with an average age of 65. i-gel® had a significantly higher success rate, resulting in a 58% greater likelihood of insertion.

Introduction of the i-gel supraglottic airway device for prehospital airway management in a UK ambulance service

Duckett J, Fell P, Han K, Kimber C, Taylor C.

Emerg Med J. 2014; 31(6): 505-7

Clinical review by North East Ambulance Service National Health Service Foundation Trust (NEAS) into the use of i-gel® as part of their advanced airway management techniques for cardiac arrests. Compared against endotracheal tube intubation, the two audits confirmed successful insertion of i-gel® at 94% and 92% respectively, against 90% and 86% for ET tube. Authors found i-gel® was also inserted more quickly and conclude that the device will 'emerge as the first choice of airway management device in prehospital cardiac arrests'.

Performance of the i-gel during pre-hospital cardiopulmonary resuscitation

Häske D, Schempf B, Gaier G, Niederberger C. Resuscitation 2013; 84(9): 1229-32

This observational study of i-gel® use during CPR assessed ease of insertion, ventilation quality, leak and whether ventilation was possible without chest compression interruption. Insertions were attempted by 63 paramedics and seven emergency physicians in pre-hospital CPR, with an overall 90% first-attempt insertion success rate. Insertion was reported as easy in 80% of cases, with the same figure representing cases with no leak recorded. In 74% of cases, continuous chest compression was still possible. The authors say that, 'the i-gel is an easy supraglottic device to insert and enables adequate ventilation during CPR'.

The effects of prewarming the I-gel® on fitting to laryngeal structure

Nishiyama T, Kohno Y, Kim HJ, Shin WJ, Yang HS. The American Journal Of Emergency Medicine 2012; 30(9): 1756-9

180 patients were randomised into two equal groups, one for insertion of i-gel® at room temperature, the other at 37º C. Insertion time, number of insertion attempts, inspiratory and leak pressures, and leak fraction were compared. Report found no significant difference between the two groups.

Extraglottic airway devices for use in diving medicine - part 3: the I-gel®

Acott CJ. Diving and Hyperbaric Medicine 2008; 38(3): 124-7

This study looked at the use of i-gel® in airway management of a patient in a diving bell, or deck decompression chamber. The study highlighted the potential limitations of some supraglottic airways used in Hyperbaric Medicine, such as possible cuff expansion with a decrease in pressure on decompression and change in cuff volume due to gas diffusion as the gas mixtures change, problems not associated with i-gel®. It showed that, subjectively, there was no change in the consistency of the i-gel® at 203 and 283kPa pressure and that no bubbles were detected following decompression from 203, 283 or 608kPa. The i-gel® was also preferred by the Diver Medical Technicians (DMTs) to the alternative device included in the manikin section of the study because it 'lacked a cuff and was easier to insert from any position'.

Anatomical and Cadaver

Initial anatomic investigations of the i-gel® airway: a novel supraglottic airway without inflatable cuff

Levitan RM, Kinkle WC. Anaesthesia 2005; 60(10): 1022-6

The first ever published study on i-gel® examined the positioning and mechanics in 65 non-embalmed cadavers, with 73 endoscopies, 16 neck dissections and six neck radiographs. The mean percentage of glottic opening score for the 73 insertions was 82%. In each of the neck dissections and radiographs the bowl of the device covered the laryngeal inlet. In their summary, the authors concluded that the i-gel® was consistently positioned over the laryngeal inlet and that the unique gel-like material of the device performed as intended, conforming to the perilaryngeal anatomy.

A Comparison of Successful Eschmann Introducer Placement Through Four Supraglottic Airway Devices

Mitchell CA, Riddle ML, Pearson NM, Tauferner DH, Carl R. Annals Of Emergency Medicine 2010; 56(3): S25

Study to determine if a bougie could be successfully placed in a cadaver by emergency medicine providers using four supraglottic airway devices: LMA Supreme®, i-gel®, LMA® and KingLT®. Time to placement, confidence in the procedure and correct placement via direct laryngoscopy post-removal were recorded. No great significant differences in most areas, however i-gel® was much quicker than KingLT® to successfully insert, and generally outperformed it. LMA Supreme® and i-gel® are considered the better devices for such a procedure, although the authors concede that using a cadaver did inhibit the study.

Oesophageal seal of the novel supralaryngeal airway device i-gel® in comparison with the laryngeal mask airways Classic and ProSealTM using a cadaver model

Schmidbauer W, Bercker S, Volk T, Bogusch G, Mager G, Kerner T. Br J Anaesth 2009; 102(1): 135-9

The three supraglottic devices were inserted into eight unfixed cadaver models with exposed oesophagi, connected to a water column producing both a slow and fast oesophageal pressure increase. During a fast increase of oesophageal pressure (simulated vomiting procedure) with the oesophageal lumen of the i-gel® and pLMA open, the authors reported that 'the entire oesophageal liquid was drained to the outside without any tracheal aspiration occurring.'

Manikin

Is an i-gel supraglottic airway useful for airway rescue in the community?

Peutrell I, Jennison N. British Journal of Midwifery 2014 May; 22(5): 254-8

Twenty midwives asked to manage newborn resuscitation scenarios on a manikin using two techniques: Bag valve mask with a Guedel, and a bag with an i-gel. Time to first breath quicker with i-gel, no significant difference in duration of inflation breaths. Higher inflation pressures generated with i-gel.

Comparison of blind intubation through the i-gel and ILMA Fastrach by nurses during cardiopulmonary resuscitation: a manikin study

Melissopoulou T, Stroumpoulis K, Sampanis M A, Vrachnis N, Papadopoulos G, Chalkias A, Xanthos T. Heart Lung. 2014 Mar-Apr; 43(2): 112-6

A group of 45 nurses inserted the i-gel® and ILMA in a manikin with and without continuous chest compressions. ILMA proved more successful than the i-gel®, but continuation of compressions caused higher insertion times in both devices. Authors conclude that nursing staff can use both devices 'as conduits with comparable success rates, regardless of whether chest compressions are interrupted or not'.

Emergency airway management by paramedics: comparison between standard endotracheal intubation, laryngeal mask airway, and I-gel

Leventis C, Chalkias A, Sampanis M A, Foulidou X, Xanthos T. Eur J Emerg Med. 2014 Oct; 21(5): 371-3

Study to investigate intubation skill levels of 72 paramedics using ETI, LMA and i-gel® in a manikin model. The success rate was higher, and the insertion time lower for those using i-gel®. There was a 'statistically significant association' between experience level and insertion time of LMA. Authors conclude that paramedics should 'lay greater emphasis on airway management using supraglottic devices, especially i-gel®'.

The quality of cardiopulmonary resuscitation using supraglottic airways and intraosseous devices: a simulation trial

Reiter DA, Strother CG, Weingart SD. Resuscitation 2013; 84(1): 93-7

Emergency Medicine residents split into teams took part in two simulated ventricular fibrillation cardiac arrests using a high fidelity simulator, testing whether use of a laryngeal mask airway improved resuscitation results. Time to airway placement, duration and success rate of airway placement and percent hands off time were among results measured. Authors conclude that use of a laryngeal mask and an IO device led to 'significantly faster establishment of an airway'.

Performance of supraglottic airway devices and 12 month skill retention: a randomised controlled study with manikins

Fischer H, Hochbrugger E, Fast A, Hager H, Steinlechner B, Koinig H, Eisenburger P, Frantal S, Greif R. Resuscitation 2011;82(3):326-31

This study compared the use of the i-gel, Supreme, Unique and ProSeal supraglottic airways and bag-valve mask ventilation. 267 third-year medical students were given standardised training before using all devices in random order on an airway training manikin. The number of attempts needed to secure the device, time to successful ventilation, tidal volume, ease of use and incidence of gastric inflation were all recorded. After 12 months, participants used the devices again without further training.

Airway management in simulated restricted access to a patient--can manikin-based studies provide relevant data?

Nakstad AR, Sandberg M.

Scand J Trauma Resusc Emerg Med. 2011 13; 19: 36

Twenty anaesthesiologists from the Air Ambulance Department at Oslo University Hospital used i-gel®, laryngeal tube LTSII™ and Macintosh laryngoscopes in two scenarios with either unrestricted (scenario A) or restricted (scenario B) access to the cranial end of the manikin. Technique selected, success rates and time to completion were primary outcomes. Results showed that in scenario B, all physicians secured the airway on first attempt, compared to 80% for ETI, whilst also completing in a quicker time. Authors conclude that 'ETI was time consuming and had a low success rate'.

A comparison of the I-gel supraglottic airway as a conduit for tracheal intubation with the intubating laryngeal mask airway: a manikin study

Michalek P, Donaldson W, Graham C, Hinds JD. Resuscitation 2010; 81(1): 74-7

A prospective study of 25 participants evaluating the success rate of blind intubation (using gum-elastic bougie, Aintree catheter and a tracheal tube) and fibrescope-guided tracheal intubation through the ILMA and i-gel on three different manikins. Success rate of fibrescope-guided technique was significantly higher than blind attempts with both devices. Results show that fibreoptic intubation through both devices in manikins is a highly successful technique.

Influence of airway management strategy on 'no-flow-time' in a standardized single rescuer manikin scenario (a comparison between LTS-D and i-gel)

Wiese CH, Bahr J, Popov AF, Hinz JM, Graf BM. Resuscitation 2009; 80(1): 100-3

Two hundred paramedics performed standardised simulated cardiac arrest management in a manikin, using either the LTS-D or an i-gel. Both devices were comparable, with the LTS-D correctly positioned at the first attempt in 98% of cases, compared to 96% for the i-gel.

Effect of chest compressions on the time taken to insert airway devices in a manikin

Gatward JJ, Thomas MJC, Nolan JP, Cook TM. Br J Anaesth 2008; 100(3): 351-6

In this study, 40 volunteer doctors regularly involved in CPR, were timed inserting four different airway devices, including i-gel® and a tracheal tube, with and without stopping chest compressions. Comparison of the speed of insertion of the different devices during CPR allowed ranking of the devices. The i-gel® was inserted approximately 50% faster than the other devices tested.

A randomised crossover comparison of manikin ventilation through Soft Seal®, i-gel™ and AuraOnce™ supraglottic airway devices by surf lifeguards

Adelborg K, Al-Mashhadi RH, Nielsen LH, Dalgas C, Mortensen MB and Løfgren B. Anaesthesia. 2014 Apr; 69(4): 343-7

Forty lifeguards took part in this manikin study, where time to ventilation and proportion of successful ventilations (both with and without 'concurrent' chest compressions) were measured. Mean time to ventilate with i-gel® was 15.6 seconds, compared to 35.2 for Soft Seal and 35.1 for AuraOnce. Authors concluded that 'most lifeguards preferred the i-gel®'.

Evaluation of chest compression effect on airway management with air-Q®, aura-i®, i-gel®, and Fastrack® intubating supraglottic devices by novice physicians: a randomized crossover simulation study

Komasawa N, Ueki R, Kaminoh Y, Nishi SI. J Anesth 2014; 28(5): 676-80

A group of 20 novice physicians inserted the named devices into manikins with or without chest compressions, whereupon insertion time and successful ventilation rate were measured. In cases of successful ventilation, blind tracheal intubation via the inserted device was performed. Chest compression did not significantly decrease ventilation success rates in each device, however insertion time with i-gel® did suffer, according to the authors.

A comparison of three supraglottic airway devices used by healthcare professionals during paediatric resuscitation simulation

Schunk D, Ritzka M, Graf B, Trabold B. Emerg Med J 2013; 30(9): 754-7

Sixty-six healthcare professionals of differing experience in paediatric airway management participated in a study comparing laryngeal masks, i-gel® and laryngeal tube. Separated into three groups and after brief training in each, the participants were asked to place the device. Positioning and time to insert were recorded. Results show that i-gel® is superior to both laryngeal mask and laryngeal tube under these circumstances.

Hands-off time during insertion of six airway devices during cardiopulmonary resuscitation: A randomised manikin trial

Ruetzler K, Gruber C, Nabecker S, Wohlfarth P, Priemayr A, Frass M, Kimberger O, Sessler D, Roessler B. Resuscitation 2011; 82(8): 1060-3

After an audio-visual lecture and practical demonstration, 40 voluntary emergency medical technicians with limited airway management experience were recruited to perform airway management with six devices, including the i-gel®, during sustained compressions on manikins. Hands-off time was significantly longer when inserting a traditional endotracheal tube, whereas the supraglottic devices were inserted successfully on each occasion.

Performance and skill retention of intubation by paramedics using seven different airway devices – a manikin study

Ruetzler K, Roessler B, Potura L, Priemayr A, Robak O, Schuster E, Frass M. Resuscitation 2011; 82 (5): 593-7

Forty-one paramedics with no previous experience watched a lecture and demonstration. They then attempted to insert each of six supraglottic airways and an ET tube into a manikin in random order. After three months, all participants were assessed again without receiving further training. All supraglottic airways except ProSeal™ were more successful than the ET tube. i-gel®, Unique® and LT-D™ had significantly faster times to insertion and ventilation than the other devices. There was no significant difference in success rates for supraglottic airways after three months, however, ET tube insertion rates decreased from 78% to 58% in that time.

Insertion of six different supraglottic airway devices whilst wearing chemical, biological, radiation, nuclear-personal protective equipment: a manikin study

Castle N, Pillay Y, Spencer N. Anaesthesia 2011; 66(11): 983-8

Six different supraglottic airway devices, including i-gel®, were tested by 58 paramedics for speed and ease of insertion in a manikin, whilst wearing either a standard uniform or chemical, biological, radiation, nuclear-person protective equipment (CBRN-PPE). During the latter test, i-gel® was the fastest of the six to insert with a mean insertion time of 19 seconds. Overall, the wearing of CBRN-PPE has a detrimental effect on insertion time of supraglottic airways.

Assessment of the speed and ease of insertion of three supraglottic airway devices by paramedics: a manikin study

Castle N, Owen R, Hann M, Naidoo R, Reeves D. Emerg Med J 2010; 27(11): 860-3

In this study, 36 final-year paramedic students were randomised into one of six groups, each of which inserted three airway devices into a manikin in a different order. The devices used were the i-gel®, the laryngeal mask airway and the Laryngeal Tube airway. The students were timed while performing each insertion and interviewed afterwards to determine which device they preferred and why. All insertions were successful on the first attempt. The i-gel® was significantly faster than its competitors with a mean insertion time of 12.3s. Due to the speed and ease of insertion, 63% of students named the i-gel® as their preferred airway.

i-gel® insertion by novices in manikins and patients

Wharton NM, Gibbison B, Gabbott DA, Haslam GM, Muchatuta N, Cook TM. Anaesthesia 2008; 63(9): 991-5

This study evaluated the performance of i-gel® in manikins and anaesthetised patients when used by novices. The i-gel® was deployed with minimal evidence of patient trauma and 100% insertion success. In their summary, the authors concluded that, 'i-gel® is rapidly inserted in both manikins and patients by novice users and compares favourably to other supraglottic airways available. Further work determining safety and efficacy during cardio-pulmonary resuscitation is required.'

Cardiocerebral Resuscitation (CCR) and Passive Oxygenation

Oxygenation, Ventilation and Airway Management in Out-of-Hospital Cardiac Arrest: A Review

Henlin T, Michalek P, Tyll T, Hinds JD, Dobias M. Biomed Res Int; 2014: 376871. Epub 2014 Mar 3

A comprehensive review assessing the changing core protocols of treatment of out-of-hospital cardiac arrest (OHCA), covering basic life support (BLS), oxygenation, passive oxygenation, airway management strategies, intubation, use of supraglottic airways and post-return of spontaneous circulation (ROSC) care.

Use of cardiocerebral resuscitation or AHA/ERC 2005 Guidelines is associated with improved survival from out-of-hospital cardiac arrest: a systematic review and meta-analysis

Salmen M, Ewy G, Sasson C. BMJ Open 2012; 3: 2(5)

Collating data from 12 observational studies on the topic, covering both guidelines, the aim was to investigate the effect of both methods of treatment on cardiac arrest patients. Authors concluded that there is an 'association with improved survival' when cardiocerebral (CCR) protocols or 2005 Guidelines are compared with older versions, and that CCR appears to be a 'promising resuscitation protocol for Emergency Medical Services'.

Passive oxygen insufflation is superior to bag-valve-mask ventilation for witnessed ventricular fibrillation out-of-hospital cardiac arrest

Bobrow B J, Ewy G A, Clark L, Chikani V, Berg R A, Sanders A B, Vadeboncoeur T F, Hilwig R W, Kern K B. Ann Emerg Med 2009; 54(5): 656-62

Retrospective analysis of statewide out-of-hospital cardiac arrests on over 1000 patients receiving either passive ventilation or bag-valve-mask ventilation treatment by paramedics. Adjusted neurologically intact survival between ventilation techniques was the main results category compared. Passive ventilation proved more successful under the terms used.

Ventilation during resuscitation efforts for out-of-hospital primary cardiac arrest

Bobrow B J, Ewy G A. Curr Opin Crit Care 2009; 15(3): 228-33

A discussion on recent findings surrounding the role of ventilation during CPR during OHCA, focusing on whether passive oxygen insufflation is an optimal form of ventilation when compared to intubation and active assisted ventilation. The authors summarise and suggest that training prehospital medical providers to use passive insufflation may increase critical organ perfusion and therefore survival after OHCA.

Cardiocerebral resuscitation improves neurologically intact survival of patients with out-of-hospital cardiac arrest

Kellum M J, Kennedy K W, Barney R, Keilhauer F A, Bellino M, Zuercher M, Ewy G. Ann Emerg Med 2008; 52(3): 244-52

The objective of this study was to compare a newly implemented protocol using the principles of cardiocerebral resuscitation against 2000 American Heart Association Guidelines for treatment of out-of-hospital cardiac arrest. Data was collected retrospectively from the two study groups, each spanning a three-year period. Cerebral performance category scores were used to define the neurological status of survivors, with '1' considered as 'intact' survival. Prior to the protocol change, 18 of 92 (20%) survived and 14 (15%) were intact. After the implementation, 42 of 89 (47%) survived and 35 (39%) were intact. Authors conclude that the implementation was associated with 'a dramatic improvement in neurologically intact survival.'

Improved patient survival using a modified resuscitation protocol for out-of-hospital cardiac arrest

Garza AG, Gratton MC, Salomone JA, Lindholm D, McElroy J, Archer R. Circulation 2009; 119(19): 2597-605

A retrospective observational cohort study reviewing all adult primary ventricular fibrillation and pulseless ventricular tachycardia cardiac arrests before and after protocol changes in the Emergency Medical System in Kansas City in the USA. Survival from out-of-hospital cardiac arrest of presumed cardiac origin improved from 7.5% to 13.9%, and survival to hospital discharge increased from an unadjusted rate of 22.4% to 43.9%. Authors confirm that the protocol changes optimising chest compressions with reduced disruptions improved return of spontaneous circulation and survival to discharge in their patients.

Efficacy of continuous insufflation of oxygen combined with active cardiac compression-decompression during out-of-hospital cardiorespiratory arrest

Saissy J-M, Boussignac G, Cheptel E, Rouvin B, Fontaine D, Bargues L, Levecque J-P, Michel A, Brochard L. Anesthesiology 2000; 92(6): 1523-30

Adult patients who had suffered nontraumatic OHCA with asystole were randomised into two groups: an IPPV group tracheally intubated with a standard tube and a continuous insufflation of air or oxygen (CIO) through microcannulas inserted into a modified endotracheal tube at a rate of 15l/min. Both groups underwent active cardiac compression-decompression with a device. Resuscitation continued for a maximum of 30 minutes, with blood gas analysis taken once stable spontaneous cardiac activity restored. Results for both groups were comparable. Arterial blood gas measure taken upon admission to hospital showed that partial pressure of arterial carbon dioxide was significantly lower in the CIO group, but pH was significantly higher. Authors conclude CIO is as effective as IPPV during OHCA.

Case Reports and Correspondence

iGel supraglottic airway use during hospital cardiopulmonary resuscitation

Larkin CB, d'Agapeyeff A, King BP, Gabbott DA. Resuscitation 2012; 83(6): E141

100 size 4 i-gel® airways were inserted in patients by a mixture of nurses, junior doctors and Resuscitation Officers, either before or after bag valve mask ventilation. 83/100 insertions were considered 'Easy' and 82/100 were inserted at the first attempt, with only one attempt resulting in complete failure. Presence of an audible leak and visible chest movement via synchronous and asynchronous ventilation were measured. 99% of users confirmed they would prefer to use i-gel® instead of an oropharyngeal airway. Authors confirm that, as a result of this test, i-gel® is their preferred supraglottic airway device of choice during the initial phase of CPR whilst the Resuscitation Team is summoned.

Pre-hospital transient airway management using the I-gel with sustained spontaneous breathing in different emergency situations

Tiesmeier J, Emmerich M. Minerva Anestesiol 2013; 79(2): 212-3

Three case studies where an i-gel® was used in an emergency situation are presented on the back of the authors' previous knowledge that this SAD has 'advantageous characteristics', including quick insertion time, good seal pressures and high success rates. Cases were: a 'violent' but sedated male patient; a 69-year-old patient suffering a cerebral seizure; and an unconscious and intoxicated patient found at home. Regurgitation and aspiration were not seen in any case. Authors conclude that, alongside other pre-clinical emergency situations, i-gel® can be used in cases of sustained spontaneous breathing, and 'could be considered for extended use outside the hospital'.

The i-gel® supraglottic airway and resuscitation - some initial thoughts

Soar J. Resuscitation 2007; 74(1): 197

This case report detailed use of a size four i-gel® during a cardiac arrest. The i-gel® was inserted in <10 seconds from opening the packet. The author was able to ventilate the patients lungs easily using a self-inflating bag-valve device connected to the i-gel®. The patients lungs were ventilated asynchronously during chest compressions with no leak. There was no evidence of aspiration. In addition, this case report confirmed the training of five non-anaesthetic trainee doctors to insert the i-gel® and ventilate an anaesthetised patient after minimal instruction. All these trainees rated i-gel® easier to insert than a laryngeal mask airway.

Pre-hospital resuscitation using the i-gel®

Thomas M, Benger J. Resuscitation 2009; 80(12): 1437

This correspondence article describes 12 attempts to ventilate patients in cardiac arrest using the i-gel®. The device could usually be inserted on the first attempt; however, on seven out of 12 occasions ventilation was then found to be inadequate. The i-gel®s were correctly positioned, but there were large leaks. The authors state that the reason for this is unclear, but that the device may be harder to position correctly when patients are not in the most appropriate position for insertion. An alternative explanation is that higher pressure is needed to ventilate the lungs after cardiac arrest, in which case other supraglottic airways should have the same problem.

I-gel supraglottic airway for rescue airway management and as a conduit for tracheal intubation in a patient with acute respiratory failure®

Campbell J, Michalek P, Deighan M. Resuscitation 2009; 80(8): 963

Case of a 54-year-old male presented as emergency admission to ICU with pneumonia. With only grade 4 laryngoscopy view achieved, first a size 4 LMA Classic was inserted, but was removed following lack of ventilation. i-gel was inserted instead allowing for good ventilation. A 3mm fibrescope was passed easily through the i-gel, which was then removed leaving a secure airway.

The i-gel® supraglottic airway: A potential role for resuscitation?

Gabbott DA, Beringer R. Resuscitation 2007; 73(1): 161-162

A letter on initial findings following clinical use of i-gel® in 100 patients. In order to evaluate its potential use in a resuscitation setting, the investigators confined their use to a size four device. They used i-gel® on 100 patients undergoing elective surgery under general anaesthesia. The device was used in patients with a weight range of 40-100kg. In 98/100 cases, the i-gel® was adequately positioned on the first or second attempt. The mean and median leak on sustained pressure was 24cmH_2O. Airway trauma, demonstrated by visible blood on the device on removal, was only detected on one occasion.There was one case of regurgitation. The gastric fluid was successfully vented through the oesophageal drainage port without any evidence of aspiration.

Failure to ventilate with supraglottic airways after drowning

Baker P A, Webber J B. Anaesth Intensive Care 2011; 39(4): 675-7

Reported failure of an i-gel® and an Ambu® AuraOnce™ to ventilate a drowning victim due to changes in lung physiology following inhalation of water requiring ventilation pressures up to 40cmH_20. Authors say that supraglottic airways, thanks to rapid insertion, are recommended for resuscitation as they facilitate the continuation of cardiac compression, however low leak pressures may cause inadequate ventilation and entrainment of air into the stomach of drowning victims.

Supraglottic airway use by lifeguards

McKenna M, Davies M. Anaesthesia 2014; 69(8): 928

A response to the Adelborg et al study on page 6, questioning whether manikin simulation "adequately reproduces" the real-life anatomic difficulties experienced in drowning patients.

Should supraglottic airway devices be used by lifeguards at all?

Baker P, Webber J. Anaesthesia 2014; 69(8): 928-9

A further response to Adelborg et al, expressing concern at this being a manikin study, and suggesting that the "vital issue" is whether a device is "fit for purpose" in the case of a drowning patient.

A reply

Lofgren B, Adelborg K. Anaesthesia 2014; 69(8): 929-30

A response to the two concerns raised above, acknowledging that more studies are needed and that there is currently "insufficient evidence" to recommend any specific ventilation technique among lifeguards. They also reiterate their study conclusions.

Supraglottic Airway Device preference and insertion speed in F1 doctors

Adlam M, Purnell D. Resuscitation 2012; 83(5): e129

Twenty-one Foundation Year One Trainees were asked to attempt to ventilate a manikin with either an LMA or i-gel®, of their own choosing. Results showed 71% chose to use an LMA, although on reflection 95% preferred the i-gel®. Speed of insertion was faster with i-gel®. Study supports use of i-gel® on resus trolleys for use by non-airway trained doctors.

Evaluation of the i-gel® airway in 300 patients

Bamgbade OA, Macnab WR, Khalaf WM. Eur J Anaesthesiol 2008; 25(10): 865-6

This letter reported that first time insertion with i-gel® was achieved in <5 seconds in 290/300 patients. Three patients with difficult airway underwent successful fibreoptic endotracheal intubation through i-gel® and all patients underwent adequate pressure mode ventilation with airway pressures of 10-30cm H_2O initially and spontaneous breathing subsequently. In addition, lubricated gastric tubes were easily inserted through the gastric channel at the first attempt in all 80 cases where this was performed. The authors concluded that 'i-gel® is very suitable for peri-operative airway management, positive pressure ventilation and weaning from ventilation. It is also useful as an intubation aid and has a potential role in airway management during resuscitation. It is very easy to use, highly reliable and associated with minimal morbidity. The gastric channel separates the oesophagus from the larynx and provides protection from aspiration. Further studies are required to compare i-gel® with other supraglottic devices.'

Reviews and Editorials

Pre-hospital airway management: The data grows rapidly but controversy remains

Lockey D, Lossius HM. Resuscitation 2014; 85(7): 849-50

An editorial discussing three studies published in the same journal issue covering different aspects of emergency advanced airway management, both out of and inside the hospital.

Resuscitation highlights in 2013: Part 2

Nolan JP, Ornato JP, Parr MJA, Perkins GD, Soar J. Resuscitation 2014; 85(4): 437-43

Second of two editorials summarising key papers published in *Resuscitation* in 2013, covering advanced life support and post-resuscitation care, amongst other topics.

Which airway for cardiac arrest? Do supraglottic airway devices have a role?

Soar J. Resuscitation 2013; 84(9): 1163-4

An editorial on the controversy when deciding the timing of an airway, ventilation intervention, optimal technique and what different types of rescuer should do.

Supraglottic airway devices during neonatal resuscitation: An historical perspective, systematic review and meta-analysis of available clinical trials

Schmolzer GM, Agarwal M, Kamlin CO, Davis PG. Resuscitation 2013; 84(6): 722-30

Review of available literature on the use of supraglottic airway devices during neonatal resuscitation. Current evidence suggests that resuscitation with a laryngeal mask is a 'feasible and safe alternative to mask ventilation in infants', however further randomised controlled trials are needed.

Resuscitation highlights in 2012

Nolan JP, Ornato JP, Parr MJA, Perkins GD, Soar J. Resuscitation 2013; 84(2): 129-36

A summary of the key papers published across the full spectrum of cardiopulmonary resuscitation.

Resuscitation highlights in 2011

Nolan JP, Ornato JP, Parr MJA, Perkins GD, Soar J. Resuscitation 2012; 83(1): 1-6

The editorial team reports a substantial increase in the number of published studies in *Resuscitation* during 2010 - here is a summary of the key papers.

2009 in review

Nolan J P, Soar J, Parr M J A, Perkins G D. Resuscitation 2010; 81(1): 1-4

Focus on the key studies published in *Resuscitation* in 2009, including cardiac arrest prevention, basic life support and CPR quality.

Airway management for out-of-hospital cardiac arrest – more data required

Nolan JP, Lockey D. Resuscitation 2009; 80(12): 1333-4

This editorial discusses the options that are available for airway management when cardiac arrest occurs outside a hospital environment. It is stated that supraglottic airways are easier to insert than endotracheal tubes and have the added benefit of allowing chest compressions to continue while they are inserted. The article references i-gel® studies with both positive and negative outcomes. Overall, insertion time was quicker but ventilation was sometimes found to be inadequate. One study showed that the i-gel® had a higher leak pressure than the cLMA, however a German study found that the i-gel® produced a tight seal at 20cm H_2O in only around half of the patients involved. Most of the available i-gel® data comes from small studies. Randomised controlled trials are needed to confirm the performance of the i-gel® and other supraglottic airways during CPR.

Strategies to prevent unrecognised oesophageal intubation during out-of-hospital cardiac arrest

Nolan J. Resuscitation 2008; 76(1): 1-2

From the abstract: 'Tracheal intubation has long been regarded as a fundamental and essential component of advanced life support (ALS). It has been assumed that tracheal intubation improves the chances of surviving from cardiac arrest. There are no reliable data to support this belief and there are several reasons why attempted intubation can be harmful, particularly when undertaken by inexperienced individuals.'

Passive Oxygenation

Airway techniques and ventilation strategies

Nolan J P, Soar J

Curr Opin Crit Care 2008; 14(3): 279-86

A review discussing the advantages and disadvantages of various methods of airway management during CPR, covering studies failing to show benefit of tracheal intubation, use of supraglottic airway devices, compression-only CPR and CCR. Authors conclude that supraglottic airways are a 'logical alternative' to tracheal intubation when CPR performed by those who are 'not highly skilled' at intubation.

Index: *by first author*

K

Kellum M, Kennedy K, Barney R, Keilhauer F, Bellino M, Zuercher M, Ewy G. Cardiocerebral resuscitation improves neurologically intact survival of patients with out-of-hospital cardiac arrest. Ann Emerg Med 2008; 52(3): 244-52.....8

Komasawa N, Ueki R, Kaminoh Y, Nishi SI. Evaluation of chest compression effect on airway management with air-Q, aura-i, i-gel, and Fastrack intubating supraglottic devices by novice physicians: a randomized crossover simulation study. J Anesth 2014; 28(5): 676-80.....6

L

Larkin CB, d'Agapeyeff A, King BP, Gabbott DA. iGel supraglottic airway use during hospital cardiopulmonary resuscitation. Resuscitation 2012; 83(6): E141.....9

Levitan RM, Kinkle WC. Initial anatomic investigations of the i-gel® airway: a novel supraglottic airway without inflatable cuff. Anaesthesia 2005; 60(10): 1022- 6.....5

Leventis C, Chalkias A, Sampanis M, Foulidou X, Xanthos T. Emergency airway management by paramedics: comparison between standard endotracheal intubation, laryngeal mask airway, and I-gel. Eur J Emerg Med. 2014 Oct; 21(5): 371-3.....5

Lockey D, Lossius HM. Pre-hospital airway management: The data grows rapidly but controversy remains. Resuscitation 2014; 85(7): 849-50..... 11

Lofgren B and Adelborg K. A reply. Anaesthesia 2014; 69(8): 929-30..... 10

M

McKenna M and Davies M. Supraglottic airway use by lifeguards. Anaesthesia 2014; 69(8): 928..... 10

Melissopoulou T, Stroumpoulis K, Sampanis M, Vrachnis N, Papadopoulos G, Chalkias A, Xanthos T. Comparison of blind intubation through the i-gel and ILMA Fastrach by nurses during cardiopulmonary resuscitation: a manikin study. Heart Lung. 2014 Mar-Apr; 43(2): 112-6.....5

Michalek P, Donaldson W, Graham C, Hinds JD. A comparison of the I-gel supraglottic airway as a conduit for tracheal intubation with the intubating laryngeal mask airway: a manikin study. Resuscitation 2010; 81(1): 74-7...6

Middleton PM, Simpson PM, Thomas RE, Bendall JC. Higher insertion success with the i-gel® supraglottic airway in out-of-hospital cardiac arrest: A randomised controlled trial. Resuscitation 2014; 85(7): 893-7.....4

Mitchell CA, Riddle ML, Pearson NM, Tauferner DH, Carl R. A Comparison of Successful Eschmann Introducer Placement Through Four Supraglottic Airway Devices. Annals Of Emergency Medicine 2010; 56(3): S25 5

N

Nakstad AR, Sandberg M. Airway management in simulated restricted access to a patient--can manikin-based studies provide relevant data? Scand J Trauma Resusc Emerg Med. 2011 13; 19: 36.....6

Nishiyama T, Kohno Y, Kim HJ, Shin WJ, Yang HS. The effects of prewarming the I-gel® on fitting to laryngeal structure. The American Journal Of Emergency Medicine 2012; 30(9): 1756- 9.....4

Nolan JP, Ornato JP, Parr MJA, Perkins GD, Soar J. Resuscitation highlights in 2013: Part 2. Resuscitation 2014; 85(4): 437-43 11

Nolan JP, Ornato JP, Parr MJA, Perkins GD, Soar J. Resuscitation highlights in 2012. Resuscitation 2013; 84(2): 129-36 11

Nolan JP, Ornato JP, Parr MJA, Perkins GD, Soar J. Resuscitation highlights in 2011. Resuscitation 2012; 83(1): 1-6..... 11

Nolan JP, Soar J, Parr MJA, Perkins GD. 2009 in review. Resuscitation 2010; 81(1): 1-4..... 11

Nolan JP, Lockey D. Airway management for out-of-hospital cardiac arrest – more data required. Resuscitation 2009; 80(12): 1333-4..... 11

Nolan J, Soar J. Airway techniques and ventilation strategies. Curr Opin Crit Care 2008; 14(3): 279-86..... 11

Nolan J. Strategies to prevent unrecognised oesophageal intubation during out-of-hospital cardiac arrest. Resuscitation 2008; 76(1): 1-2 11

P

Peutrell I, Jennison N. Is an i-gel supraglottic airway useful for airway rescue in the community? British Journal of Midwifery 2014 May; 22(5): 254-8 5

R

Reiter DA, Strother CG, Weingart SD. The quality of cardiopulmonary resuscitation using supraglottic airways and intraosseous devices: a simulation trial. Resuscitation 2013; 84(1): 93-7 5

Ruetzler K, Gruber C, Nabecker S, Wohlfarth P, Priemayr A, Frass M, Kimberger O, Sessler D, Roessler B. Hands-off time during insertion of six airway devices during cardiopulmonary resuscitation: A randomised manikin trial. Resuscitation 2011; 82(8): 1060-3.....7

Ruetzler K, Roessler B, Potura L, Priemayr A, Robak O, Schuster E, Frass M. Performance and skill retention of intubation by paramedics using seven different airway devices – a manikin study. Resuscitation 2011; 82(5): 593-7.....7

S

Saissy J-M, Boussignac G, Cheptel E, Rouvin B, Fontaine D, Bargues L, Levecque J-P, Michel A, Brochard L. Efficacy of continuous insufflation of oxygen combined with active cardiac compression-decompression during out-of-hospital cardiorespiratory arrest. Anesthesiology 2000; 92: 1523-30 ..8

Salmen M, Ewy G, Sasson C. Use of cardiocerebral resuscitation or AHA/ERC 2005 Guidelines is associated with improved survival from out-of-hospital cardiac arrest: a systematic review and meta-analysis. BMJ Open 2012; 3: 2(5).....7

Schmidbauer W, Bercker S, Volk T, Bogusch G, Mager G, Kerner T. Oesophageal seal of the novel supralaryngeal airway device i-gel® in comparison with the laryngeal mask airways Classic and ProSeal™ using a cadaver model. Br J Anaesth 2009; 102(1): 135-9 5

Schmolzer GM, Agarwal M, Kamlin CO, Davis PG. Supraglottic airway devices during neonatal resuscitation: An historical perspective, systematic review and meta-analysis of available clinical trials. Resuscitation 2013; 84(6): 722-30..... 11

Schunk D, Ritzka M, Graf B, Trabold B. A comparison of three supraglottic airway devices used by healthcare professionals during paediatric resuscitation simulation. Emerg Med J 2013; 30(9): 754-7.....6

Soar J. Which airway for cardiac arrest? Do supraglottic airway devices have a role? Resuscitation 2013; 84(9): 1163-4 11

Soar J. The i-gel® supraglottic airway and resuscitation - some initial thoughts. Resuscitation 2007; 74(1): 197.....9

T

Thomas M, Benger J. Pre-hospital resuscitation using the i-gel®. Resuscitation 2009; 80(12): 1437 9

Tiesmeier J, Emmerich M. Pre-hospital transient airway management using the I-gel with sustained spontaneous breathing in different emergency situations. Minerva Anestesiol 2013; 79(2): 212-3.....9

W

Wharton NM, Gibbison B, Gabbott DA, Haslam GM, Muchatuta N, Cook TM. i-gel® insertion by novices in manikins and patients. Anaesthesia 2008; 63(9): 991-5 7

Wiese CH, Bahr J, Popov AF, Hinz JM, Graf BM. Influence of airway management strategy on 'no-flow-time' in a standardized single rescuer manikin scenario (a comparison between LTS-D and i-gel). Resuscitation 2009; 80(1): 100-3 6

Index: *by Journal Title*

British Journal of Anaesthesia

Gatward JJ, Thomas MJC, Nolan JP, Cook TM. Effect of chest compressions on the time taken to insert airway devices in a manikin.

Br J Anaesth 2008; 100(3): 351-6.....6

Schmidbauer W, Bercker S, Volk T, Bogusch G, Mager G, Kerner T. Oesophageal seal of the novel supralaryngeal airway device i-gel® in comparison with the laryngeal mask airways Classic and ProSeal™ using a cadaver model.

Br J Anaesth 2009; 102(1): 135-9.....5

British Journal of Midwifery

Peutrell I, Jennison N. Is an i-gel supraglottic airway useful for airway rescue in the community?

British Journal of Midwifery 2014 May; 22(5): 254-8.....5

Circulation

Garza AG, Gratton MC, Salomone JA, Lindholm D, McElroy J, Archer R. Improved patient survival using a modified resuscitation protocol for out-of-hospital cardiac arrest.

Circulation 2009; 119(19): 2597-605.....8

Current Opinion in Critical Care

Bobrow B, Ewy G. Ventilation during resuscitation efforts for out-of-hospital primary cardiac arrest.

Curr Opin Crit Care 2009; 15(3):228-33.....8

Nolan J, Soar J. Airway techniques and ventilation strategies.

Curr Opin Crit Care 2008; 14(3): 279-86.....11

Diving and Hyperbaric Medicine

Acott CJ. Extraglottic airway devices for use in diving medicine - part 3: the I-gel®.

Diving and Hyperbaric Medicine 2008; 38(3): 124- 127.....4

Emergency Medicine Journal

Castle N, Owen R, Hann M, Naidoo R, Reeves D. Assessment of the speed and ease of insertion of three supraglottic airway devices by paramedics: a manikin study.

Emerg Med J 2010; 27(11): 860-3.....7

Duckett J, Fell P, Han K, Kimber C, Taylor C. Introduction of the i-gel supraglottic airway device for prehospital airway management in a UK ambulance service.

Emerg Med J. 2014; 31(6): 505-7.....4

Schunk D, Ritzka M, Graf B, Trabold B. A comparison of three supraglottic airway devices used by healthcare professionals during paediatric resuscitation simulation.

Emerg Med J 2013; 3(9): 754-7.....6

European Journal of Anaesthesiology

Bamgbade OA, Macnab WR, Khalaf WM. Evaluation of the i-gel® airway in 300 patients.

Eur J Anaesthesiol 2008; 25(10): 865-6.....10

European Journal of Emergency Medicine

Leventis C, Chalkias A, Sampanis M, Foulidou X, Xanthos T. Emergency airway management by paramedics: comparison between standard endotracheal intubation, laryngeal mask airway, and I-gel.

Eur J Emerg Med. 2014 Oct; 21(5): 371-3.....5

Heart & Lung

Melissopoulou T, Stroumpoulis K, Sampanis M, Vrachnis N, Papadopoulos G, Chalkias A, Xanthos T. Comparison of blind intubation through the i-gel and ILMA Fastrach by nurses during cardiopulmonary resuscitation: a manikin study.

Heart Lung. 2014 Mar-Apr; 43(2): 112-6.....5

Journal of Anesthesia

Komasawa N, Ueki R, Kaminoh Y, Nishi SI. Evaluation of chest compression effect on airway management with air-Q, aura-i, i-gel, and Fastrack intubating supraglottic devices by novice physicians: a randomized crossover simulation study.

J Anesth 2014; 28(5): 676-80.....6

Minerva Anestesiologica

Tiesmeier J, Emmerich M. Pre-hospital transient airway management using the I-gel with sustained spontaneous breathing in different emergency situations.

Minerva Anestesiol 2013; 79(2): 212-3 ..... *9*

Resuscitation

Adlam M, Purnell D. Supraglottic Airway Device preference and insertion speed in F1 doctors.

Resuscitation 2012; 83(5): e129 ..... *10*

Campbell J, Michalek P, Deighan M. I-gel supraglottic airway for rescue airway management and as a conduit for tracheal intubation in a patient with acute respiratory failure.

Resuscitation 2009; 80(8): 963 ..... *9*

Gabbott DA, Beringer R. The i-gel® supraglottic airway: A potential role for resuscitation?

Resuscitation 2007;73(1): 161-2 ..... *9*

Larkin CB, d'Agapeyeff A, King BP, Gabbott DA. iGel supraglottic airway use during hospital cardiopulmonary resuscitation.

Resuscitation 2012; 83(6): E141 ..... *9*

Fischer H, Hochbrugger E, Fast A, Hager H, Steinlechner B, Koinig H, Eisenburger P, Frantal S, Greif R. Performance of supraglottic airway devices and 12 month skill retention: a randomised controlled study with manikins.

Resuscitation 2011; 82(3): 326-31 ..... *6*

Häske D, Schempf B, Gaier G, Niederberger C. Performance of the i-gel during pre-hospital cardiopulmonary resuscitation

Resuscitation 2013; 84(9): 1229-32 ..... *4*

Lockey D, Lossius HM. Pre-hospital airway management: The data grows rapidly but controversy remains.

Resuscitation 2014; 85(7): 849-50 ..... *11*

Michalek P, Donaldson W, Graham C, Hinds JD. A comparison of the I-gel supraglottic airway as a conduit for tracheal intubation with the intubating laryngeal mask airway: a manikin study.

Resuscitation 2010; 81(1): 74-77 ..... *6*

Middleton PM, Simpson PM, Thomas RE, Bendall JC. Higher insertion success with the i-gel® supraglottic airway in out-of-hospital cardiac arrest: A randomised controlled trial.

Resuscitation 2014; 85(7): 893-7 ..... *4*

Nolan JP, Ornato JP, Parr MJA, Perkins GD, Soar J. Resuscitation highlights in 2013: Part 2.

Resuscitation 2014; 85(4): 437-43 ..... *11*

Nolan JP, Ornato JP, Parr MJA, Perkins GD, Soar J. Resuscitation highlights in 2012.

Resuscitation 2013; 84(2): 129-36 ..... *11*

Nolan JP, Ornato JP, Parr MJA, Perkins GD, Soar J. Resuscitation highlights in 2011.

Resuscitation 2012; 83(1): 1-6 ..... *11*

Nolan J, Soar J, Parr M, Perkins G. 2009 in review.

Resuscitation 2010; 81(1): 1-4 ..... *11*

Nolan JP, Lockey D. Airway management for out-of-hospital cardiac arrest – more data required.

Resuscitation 2009; 80(12): 1333-4 ..... *11*

Nolan J. Strategies to prevent unrecognised oesophageal intubation during out-of-hospital cardiac arrest.

Resuscitation 2008; 76(1): 1-2 ..... *11*

Reiter DA, Strother CG, Weingart SD. The quality of cardiopulmonary resuscitation using supraglottic airways and intraosseous devices: a simulation trial.

Resuscitation 2013; 84(1): 93-7 ..... *5*

Ruetzler K, Gruber C, Nabecker S, Wohlfarth P, Priemayr A, Frass M, Kimberger O, Sessler D, Roessler B. Hands-off time during insertion of six airway devices during cardiopulmonary resuscitation: A randomised manikin trial.

Resuscitation 2011; 82(8): 1060-3 ..... *7*

Ruetzler K, Roessler B, Potura L, Priemayr A, Robak O, Schuster E, Frass M. Performance and skill retention of intubation by paramedics using seven different airway devices – a manikin study.

Resuscitation 2011; 82 (5): 593-7 ..... *7*

Schmolzer GM, Agarwal M, Kamlin CO, Davis PG. Supraglottic airway devices during neonatal resuscitation: An historical perspective, systematic review and meta-analysis of available clinical trials.

Resuscitation 2013; 84(6): 722-30 ..... *11*

Soar J. Which airway for cardiac arrest? Do supraglottic airway devices have a role?

Resuscitation 2013; 84(9): 1163-4 ..... *11*

Soar J. The i-gel® supraglottic airway and resuscitation - some initial thoughts.

Resuscitation 2007; 74(1): 197 ..... *9*

Thomas M, Benger J. Pre-hospital resuscitation using the i-gel®.

Resuscitation 2009; 80(12): 1437.....*9*

Wiese CH, Bahr J, Popov AF, Hinz JM, Graf BM. Influence of airway management strategy on 'no-flow-time' in a standardized single rescuer manikin scenario (a comparison between LTS-D and i-gel).

Resuscitation 2009; 80(1): 100-3.....*6*

Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine

Nakstad AR, Sandberg M. Airway management in simulated restricted access to a patient--can manikin-based studies provide relevant data?

Scand J Trauma Resusc Emerg Med. 2011 13; 19: 36.....*6*

The American Journal of Emergency Medicine

Nishiyama T, Kohno Y, Kim HJ, Shin WJ, Yang HS. The effects of prewarming the I-gel® on fitting to laryngeal structure.

The American Journal Of Emergency Medicine 2012; 30(9): 1756- 9.....*4*

INTERSURGICAL®
COMPLETE RESPIRATORY SYSTEMS

Intersurgical Ltd, Crane House, Molly Millars Lane, Wokingham, Berkshire, RG41 2RZ, UK
T: +44 (0)118 965 6300 F: +44 (0)118 965 6356 info@intersurgical.com www.intersurgical.com

The manufacturer Intersurgical Ltd is certified to ISO 9001:2015, ISO 13485:2003 and ISO 14001:2015

Please think before you print
Save energy and paper.
If you must print this information sheet please print it double sided.

Resus_and_Emerg_Bib
Issue 2 01.19

UK • Ireland • France • Germany • Spain • Portugal • Italy • Benelux • Sweden • Denmark • Lithuania • Russia • Czech Republic
Turkey • South Africa • China • Japan • Taiwan • Philippines • USA • Canada • Colombia • Australia