

The Advanced Nurse Practitioner



The journal for
members of ACAP

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Scotland Leading the way for Acute Care Practitioners



ACAP Scotland is a new and exciting network that will enable all acute care practitioners to register as members allowing provision for annual forum events. These events will host guest speakers, work shops, master classes and the opportunity for discussion on topical subjects. Most importantly the forum will facilitate educational and professional development.

Members will also be entitled to quarterly newsletters and unlimited ACAP web site access

Acute care practitioners in Scotland have never had until now:



- ⇒ The privilege of having an arena to showcase areas of good practice,
- ⇒ The opportunity to bench mark other practices throughout Scotland,
- ⇒ A national opportunity for education
- ⇒ And most importantly have their voice heard.

Now with the onset of ACAP forum Scotland all this will be possible.

Mission Statement

The purpose of the forum is to promote and develop the professional role of the acute care advanced nurse practitioner in partnership with stakeholders, in order to advance the quality of care delivered to patients and clients.

ACAP Scotland Leading the way

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• www.acapscotland.org •

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To receive a copy of future ACAP publications please email elaine.headley@gmail.com or jsmith53@nhs.net

Conference

The 4th National Conference will be held on 1st November 2013, at Grand Central Hotel, Glasgow. Further details can be found within the journal.

We are looking for poster presentations, and will be presenting the winner with a £20 book token. If you have any queries or wish to submit an abstract please contact Julie at julessmith69@hotmail.com.

Congratulations

- To David Watson, ACAP committee member & HECT senior charge nurse, for having a poster presentation accepted for an international conference in Hawaii
- David has also been accepted to speak at the Emergency Care Conference in Birmingham in Feb 2014 and has been accepted to present poster at RCN Emergency Care Conference in Brighton in November 2013.
- Elaine Headley, (HECT senior charge nurse & ACAP co-lead), with two colleagues, Martin Carberry (Nurse Consultant for critical care in NHS Lanarkshire) and Pauline Clements, (HECT senior charge nurse), are having their Trigger Question research being published in the Nursing Times. They have also been invited to apply for the Nursing Times Awards.
- To Karen Kindness, ACAP member and her colleagues from the Northeast of Scotland Cardiothoracic Unit in Aberdeen from for her fund raising contribution to the Chest, Heart & Stroke Scotland. They abseiled down the Forth Rail Bridge raising £3,721
- More information about this event can be found at http://www.chss.org.uk/about_us/ and video of the day at https://www.youtube.com/watch?feature=player_embedded&v=Jl4Uz1BU4c

- To Julie McQuade HECT senior charge nurse from NHS Lanarkshire & ACAP member, for her fund raising event at The Mad 'Hearters' Tea Party in Oban to raise money for Yorkhill sick children's cardiology department sick children to the sum of over £2,200

- Pete Thompson, critical care ANP from NHS Lothian and ACAP committee member has completed his Masters in advanced practice in critical care.

- And to Anne Scott Elderly Care ANP in Lothian and ACAP secretary who was recently appointed as the ANP Team Lead for COMPASS/Medicine for the Elderly in the Royal Infirmary Edinburgh.

Well done to all

- NHS Lothian H@N team are to start rolling out Hospital at Weekends. We look forward to hearing more about the development.

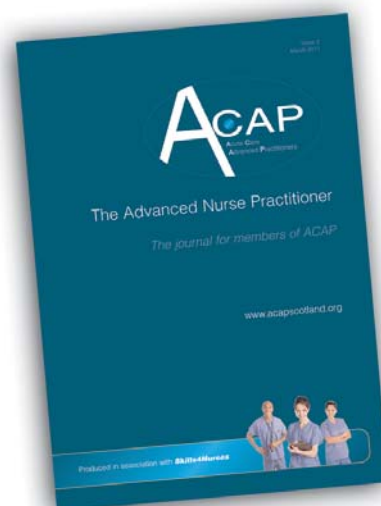
- Guardian awards – Julie and Elaine are putting forward an application for ACAP in the Health Care Innovation Awards, Partnership in Care section.

- ACAP have a new writer for the November journal from USA. Frieda Fuller, an educationalist from New York will be sharing how advanced practice works in the US.

- ACAP are delighted to have Margaret Brown as part of the committee. Margaret is the part-time nurse consultant Hospital at Home service in primary care in NHS Ayrshire & Arran. This continues to help us forge partnerships with primary care.

Skills4Nurses Recruitment Events

Skills4Nurses are pleased to announce their forthcoming Nursing & Midwifery Recruitment event in Glasgow on Wednesday 9th October in the Grand Central Hotel which proved to be a great venue for 2012. Log on to: www.skills4nurses.com for further details or email: shona@gmexpos.com



The Grand Central Hotel

99 Gordon Street, Glasgow, Scotland, G1 3SF Tel: 0141 240 3700

The Venue for ACAP Scotland's 4th national event on 1st November 2013

A Superior Hotel in the Heart of Glasgow

The Grand Central Hotel stands in the centre of Glasgow and is a beloved icon in this vibrant city. After a £20 million refurbishment the Grand Central is now one of Glasgow's leading conferences, banqueting and short break destinations. It also stands tall above other luxury hotels in Glasgow as the finest four star establishments in the city.

At the Grand Central you can book space for inspirational conferences, high class meetings or business training. Alternatively you could reserve a banqueting suite for a fabulous event, such as a wedding reception. Other guests come to sample the delights of this celebrated city and to relax and pamper themselves in this stunning, stylish and sumptuous hotel. If you are searching for luxury hotels in Glasgow, look no further than the Grand Central.

A striking icon among hotels in Glasgow

The Grand Central Hotel is one of, if not the best of the numerous hotels in Glasgow. It certainly impressed at the 2013 Scottish Hotel Awards, which bestowed several accolades on this establishment, including:

- Scottish Hotel of the Year
- Events Hotel of the Year
- Manager Gold Medal for Murray Thomson
- People Manager of the Year for Claire Cuthbertson, Glasgow & Clyde Regional Wedding Venue of the Year
- Rising Star Medal for Lynsey Eckford
- Rising Star Medal for Barry Van Den Berg



We also won The CIS Excellence Award for Business Innovation at the recent CIS Excellence Awards. There are several great hotels in Glasgow, but it seems none can compete with the facilities, luxury and location of the Grand Central.

To find out about all events including weddings call **0141 240 3700**. To book a bedroom please use the booking form or call **0844 854 2910**

Our History

Central Station, the main train hub of Glasgow was opened by Caledonian Railways in 1879 with the neighbouring Central Hotel opening just 4 years later. The hotel was designed by Scottish architect Robert Rowand Anderson and he adopted the Queen Anne style of architecture; an informal style that includes picturesque details, intricate gables and multi-paned windows. Over the years, the hotel was extended and adapted but the main architecture was maintained.

Grand Visitors

The Central Hotel has played host to many significant celebrity faces but is probably best known for being the venue to which the world's first long-distance television pictures were transmitted on 24 May 1927 by John Logie Baird.

The Central Hotel has entertained most of the world's leading politicians, from JFK to Winston Churchill and Hollywood superstars including Laurel and Hardy and Frank Sinatra, not to mention Roy Rogers and his trusty Trigger: it was even reported at the time that Trigger had a bigger suite than Roy Rogers!

The Future

Once the recent renovation and transformation was completed, the Grand Central Hotel has again taken its place as Glasgow's leading four-star hotel. It is now a muststay destination for shoppers, theatre-goers and short break guests to the city. It has the latest luxuries for business travellers and gives conference and banqueting organisers the WOW factor they want for their next event. Source for this information can be read in full at <http://www.principal-hayley.com/ph-hotels/grand-central-hotel.aspx>

Acute Care Advanced Practice (ACAP): 3 years on

Advance nursing practice is not a new concept. It has been a well established practice in the USA since the early 1960's. The inception materialised essentially as a response to socio-political and professional forces, namely a shortage in primary physicians (Mantzoukas 2007, Mc Gee & Castledine 2003). However, it wasn't until the 1980's and 1990's that advanced practice became a diversion in the traditional delivery of nursing care in the UK. This saw the development of titles such as specialist nurses. However in the past decade alone advance practice has witnessed unprecedented increase in practice and roles (Bryant-Leuksius et al 2004, Mantzoukas 2007). This escalation in development was initiated as a result of the European Working Time Directives (EWTD) Department of health 2009). To this end it facilitated the development of experienced nursing staff to embark on the advanced nurse practitioner road, changing the traditional way nurses provided care for patients. Developing advanced assessment skills, ensuring all necessary investigation were carried out, initiating essential treatment, for example non invasive ventilation, formulating a list of differential diagnoses and of course now as qualified independent nurse prescribers, prescribing medication and ensuring that delivery, has all provided the patient with the timely and appropriate care. This has often preventing unscheduled admissions to intensive care units (ITU), or indeed ensured the safe transfer of acutely unwell adults to these units.

Despite all these marvellous and ongoing developments, many Advanced Nurse Practitioners (ANP's) felt a sense of isolation and somewhat disjointed in their service delivery. Recognising a gap we resolved to set up a Scottish forum devoted to all Acute Care Advanced Practitioners (ACAP's), there was nothing in Scotland of this nature, solely dedicated to ACAP's. Having a vision of establishing a Scotland wide forum to incorporate all acute care advanced practitioners was a daunting thought, but when enquiring whether or not such a service would be sought after by ACAP's it became obvious that there was indeed a need and a desire for such a provision, consequently ACAP national forum came into being. ACAP is now almost three years old, and we as a steering group propose to keep ACAP

members abreast of the progress over the last three years.

At the onset of ACAP it became apparent that setting of objectives would prove necessary, to provide focus and direction (table 1). Thorpe et al (1997) report that objectives can be viewed as quantifiable, operational statements. As a result, setting objectives ensures that forum members will understand what it is we wish to achieve and will additionally allow the committee to audit and measure that outcomes are being met (Fry et al 2001). However, Fry et al (2001) warns that one of the downfalls of setting objectives is that it can be viewed as author orientated. In an attempt to overcome this pitfall, objectives were set not by one person but through a shared vision of the steering group. Three years on we as a steering group have revisited the initial objectives to ensure we are delivering on our promise.

To provide a platform for sharing evidenced based practice/ To provide an opportunity for education/ To provide an arena for networking.

We have employed a number of mediums in a concerted effort to meet these objectives. Since the inception of ACAP, there have been three national forums, attracting ACAP members from all over Scotland. The focus of the events has been on education and sharing of practice. When we initially set up ACAP we envisaged that events would be focussed on practitioners delivering lectures/case studies/sharing of practice, we are delighted that each event has had at least one practitioner delivering a lecture. Forum Events have provided an excellent opportunity for networking with other ACAP members, reducing the sense of isolation previously felt by some ACAPs.

These events have proven very successful and have evaluated extremely well, ACAP is for the practitioners and we as a steering group depend on ACAP evaluation to focus future and subsequent events.

This is the eighth edition of The Advanced Nurse Practitioner (TANP) journal; TANP is a 16 page periodical in which ACAP members can write and have their articles published. This would ideally provide them with the confidence and a platform to write for more established academic publications.

The Advanced Nurse Practitioner is published every 4 months, essentially as an ecopy, but is provided in hard copy for the forum events. ACAP would like to express their thanks to Mr Jim Brown and Shona McMahon of Skills 4 Nurses who are instrumental in publishing TANP.

Additionally the web site (www.acapscotland.org) is also a medium for sharing of best practice and educational links. In addition the web site also has provision for discussion between practitioners, allowing for sharing of practice and a place for practitioners to go if they are looking for information from other ACAP members. The web site has 230 registered members and over 300 following on social networking sites like Twitter. Joining ACAP via the web remains free to all. ACAP would like to express their thanks to Mr David McDermott a Microsoft engineer who designed and built what is now a well established site David is still the ACAP information technology manager.

To provide a link between Acute Care Advanced Practitioners (ACAP'S) and major stakeholders/ to provide ACAPs with a "voice".

ACAP has been used as part of a poster presentation in Brisbane Australia. In addition we have had posters accepted for primary care fringe at last year's NHS conference in Glasgow, had poster selection accepted for the RCN international conference in London and again poster accepted for R&D conference in NHS Lanarkshire. Poster presentations at local, national and international events have allowed the steering group to keep advanced nursing practice at the forefront of major stakeholder's minds.

ACAP have been fortunate enough to be invited to The West of Scotland (WoS) Advanced practice working group meetings. The WoS working group consists of heads of Advanced Practice from all West of Scotland Boards, Advanced Practice HEI leads and leads of practice development units. The WoS working group was formulated to influence the direction, homogenisation and development of advanced practice across the West of Scotland. Attendance at these meetings, allows ACAP to share the views of the practitioners and act as the practitioners voice.

ACAP continues to forge links with leads from the HEIs, and is fortunate to have non executive members from the HEIs on the steering group.

Around 18 months ago the then minister from health, Ms Nicola Sturgeon, acknowledged and voiced support for the group with an offer to work on a consultancy basis.

OBJECTIVES:

- To provide a platform for sharing evidenced based practice.
- To provide a link between Acute Care Advanced Practitioners (ACAP'S) and major stakeholders.
- To provide an arena for networking.
- To provide ACAPs with a "voice".
- To provide an opportunity for education

Table 1

Funding of course was and still is an ongoing issue. The decision was agreed that no payment would be asked for to become an ACAP member, instead paying a nominal fee for conference attendances would be sufficient. Securing support from pharmaceutical and device companies has been a tremendous support for ACAP to accommodate national forum events.

Gaining registration as a Scottish Registered Charity was also an enormous piece of work for the committee. This was in particular down to Ms. Fiona Buchan, the ACAP treasurer. Success here meant ACAP was provided with additional security from a governance perspective. All of the undertakings from the ACAP committee and non committee members are done on a voluntary basis to unite practitioners, provide a platform to share good practice and have an arena to be heard and learn from each other. All of this is achieved from the forum events and the website and of course the ACAP journal.

Bringing practitioners together and linking the commonalities that are universal with the differences within each of our practices has been in itself a marvellous achievement. We represent practitioners from Dumfries & Galloway to Inverness, but the ACAP work is far from over. There are so many other avenues as yet untouched. The vision of the committee and the ethos that drives them will continue to ensure the best for the ACAP members.

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Refeeding Syndrome : An Introduction

Elaine Headley

Introduction

This article is to raise awareness of a potentially life threatening and very often overlooked condition, indeed Mehanna et al (2008) suggest that refeeding syndrome (RFS) is a well described but an often forgotten about condition. Additionally Mehanna et al (2008) argue that the true incidence of RFS is unknown, which may in part be due to the lack of a universally agreed definition. RFS was first recognized in Americans who had been held in Japanese prisoner of war camps during World War II; when it was noted that the reintroduction of food following prolonged periods of starvation precipitated cardiac failure and neurological disturbances. Ideally, improved recognition about the potentials of this condition will facilitate many advanced nurse practitioners (ANP's) to interject early and therefore prevent some life threatening conditions. Khan et al (2011) suggests there are only crude estimations of the incidences of morbidity and mortality, with Mehanna et al (2008) highlighting that no randomised control trials of treatment have been published. Additionally Khan et al (2011) stipulate that RFS can occur in any individual, but is more common in "at risk" populations, arguably then increasing awareness among health care professionals is likely to reduce the mortality of the condition. However, Hearing (2004) suggests that understanding RFS and its treatment is limited among general physicians and surgeons due to the lack of input from specialist units being involved in the patient's recovery.

Who is more at risk?

Crook et al (2001) stipulate that those at most risk of RFS are people suffering

Kwashiorkor or marasmus
Anorexia nervosa
Chronic malnutrition eg from cancers or in the elderly
Chronic alcoholism
Prolonged fasting
Duodenal switch surgery for obesity
Hunger strikers
Oncology patients
Post operative patients

Box 1 Crook et al (2001)

from marasmus (chronic undernourishment occurring especially in children, a deficiency of protein as well as energy nutrients) or kwashiorkor conditions (malnutrition mainly in children caused by not enough protein in the diet despite reasonable calorific intake). This is of particularly importance if there has been greater than 10% weight loss over just a few months, or for those who have been without food for 7 to 10 days (Crook et al 2001). Other groups of patients at risk are identified in box 1.

Physiology

Abnormal Glucose & Lipid Metabolism: Berg et al (2002) detail that when food is in abundance; carbohydrates are the main source for energy requirements. Glucose, the principle product of carbohydrate digestion, is actively co-transported along with sodium at the intestinal brush border against a concentration gradient. Glucose enters the portal circulation by this facilitated diffusion allowing the blood sugar levels rise. Insulin is then released from the Islets of Langerhans in the pancreas, which promotes glycogenesis, inhibits lipolysis and increases cellular uptake of potassium. When glycogen storage capacity is exceeded, lipogenesis occurs with non-oxidised glucose

being converted to fat and stored as triglycerides in adipose tissue (Berg et al 2002). In those who are in a chronically starved state, insulin secretion is reduced in parallel with low carbohydrate intake. Fat catabolism predominates, and free fatty acids and ketones replace glucose as the main source of energy (Fung and Rimmer 2005). Glucose homeostasis is essential for the integrity of such elements as brain, erythrocytes and the cells of the renal medulla (Kraft et al 2005). The gluconeogenesis that entails results from non-carbohydrate sources metabolising to glucose. Khan (2010) identifies the most important of these is the muscle protein alanine, this in addition with the oxidised fatty acids from liver hepatocytes generate ketone bodies. Subsequently these convert to acetyl-coenzyme-A, which generates energy via a Kerbs cycle (fig 1). Additional energy is produced from lactate and pyruvate (product of glycolysis) and amino acids occur via the Cori cycle (fig 2) (Berg et al 2002).

Disturbances in Body Fluid Distribution:

These can precipitate cardiac failure, dehydration or fluid overload, hypotension, pre-renal failure and sudden death (Crook et al 2001). RFS with carbohydrates can reduce water and sodium excretion, resulting in expansion of the extra-cellular fluid compartment and weight gain, particularly if sodium intake is increased. RFS with predominately protein or lipid can result in weight loss and urinary sodium excretion, which increases the risk of negative sodium balance. High protein feeding can also result in hypernatraemia associated with hypertonic dehydration, azotemia and metabolic acidosis (Crook et al 2001).

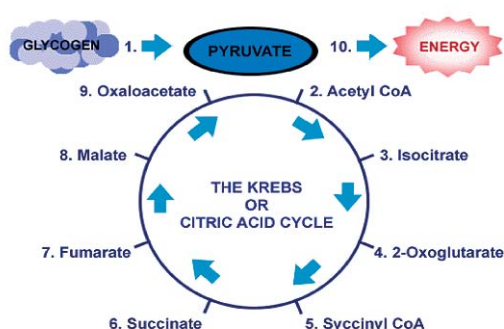


Figure 1

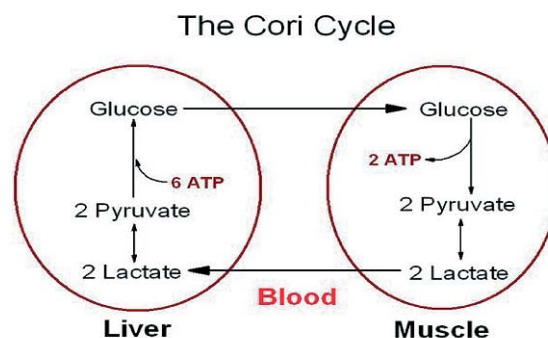


Figure 2

Thiamine deficiency:

Mehanna et al (2008), recognises that this may occur at variable rates, but the importance of its replacement in RFS. They identify thiamine as an essential coenzyme in carbohydrate metabolism and its deficiency in contributing to conditions like Wernicke's encephalopathy, ocular abnormalities, (ataxia, confusional state, hypothermia and coma), or Korsakoff's syndrome (retrograde & antergrade amnesia, confabulation) Mehanna et al (2008) Reuler et al (1985).

Hypophosphataemia

This is one of the predominant features of RFS. Adult humans store between 500-800g of phosphate of which around 80% is in the bony skeletal and 20% in the soft tissue (Crook et al 2001). Phosphate is the major intracellular anion and shifts between intracellular and extracellular compartments and is essential for cell function as well as acting as an intracellular buffer for hydrogen ions in the urine (Stoff 1982). Clinical manifestations of severe loss of phosphate can result in

- impaired skeletal function;
- cardiomyopathy;
- effects on the nervous system resulting in seizures;
- renal tubular impairment with acute tubular necrosis secondary to rhabdomyolysis;
- impairment of diaphragmatic contractibility, which is thought to contribute to poor weaning from mechanical ventilatory support.
- In severe hypophosphatemia thrombocytopenia and haemolysis can occur (Crook et al 2001).

Hypomagnesaemia

Magnesium is found mainly in the bone and muscle of the body and is essential as a cofactor for many enzymes. Although up to 70% of the dietary magnesium intake is not absorbed but eliminated in the faeces, the major excretory route is via the renal system (Crook et al 2001). Khan et al (2010) identify symptoms of hypomagnesaemia includes: cardiac arrhythmias; respiratory hypoventilation, distress and failure; neurological weakness fatigue and muscle cramps, vertigo, parasthesia, depression and convulsion; gastrointestinal abdominal pain, diarrhoea, vomiting and anorexia.

Clinical features of RFS:

Clinical feature	Possible mechanism
<u>Cardiovascular</u> Acute cardiac failure	Fluid retention (secondary to CHO intake & hyperinsulinaemia) arrhythmias, cardiomyopathy
Arrhythmias, sudden cardiac death	Electrolyte imbalance
<u>Respiratory</u> Respiratory failure	Diaphragmatic myopathy
<u>Neurological</u> Seizures, paraesthesiae	Electrolyte and/metabolic disturbances, cellular hypoxia secondary to reduced DGP (diphosphoglycerate) and ATP (adenosine triphosphate)
Wernicke's encephalopathy	Thiamine deficiency
<u>Gastrointestinal</u> Diarrhoea /constipation	Electrolyte and / metabolic disturbances, intestinal atrophy following malnutrition
<u>Haematological</u> Sepsis	Leukocyte dysfunction, hyperglycaemia, acid base disturbances
Haemorrhage	Thrombocytopenia, platelet dysfunction
Haemolytic anaemia	depletion of erythrocyte ATP, resulting in increased cell membrane rigidity
<u>Metabolic</u> Hyperglycaemia	Glucose ingestion
Acid base disturbances	Impaired phosphate renal buffering
<u>Renal</u> Acute Tubular Necrosis (ATN)	Rhabdomyolysis
<u>Musculoskeletal</u> Myopathy	Depletion of muscle APT, electrolyte disturbances
Rhabdomyolysis	Impaired production of phospholipid cell membranes causes sarcolemma dysfunction

Fung & Rimmer (2005)

Hypokalaemia

Mehanna et al (2008) stipulate that potassium is the major intracellular cat-ion, which is again severely depleted in undernourished individuals. Although the serum concentration may remain normal, changes in the anabolism of

refeeding the potassium is taken into the cells as they increase in volume and number and as a direct result of insulin secretion. This results in severe hypokalaemia and has the potential to cause arrhythmias and cardiac arrest (Mehanna et al 2008).

Management

Khan et al (2011) stipulate the principles of management are to correct the biochemical abnormalities and fluid imbalances, normalising where possible. However Crook et al (2001) highlights that there has been controversy over the timing of correcting these abnormalities, arguing that that correction of the electrolyte abnormalities must occur prior to the commencement of feeding. However, the more recent National Institute for Health and Clinical Excellence (NICE 2006 in Mehanna et al 2008) guidelines recommend the immediate start of nutritional support at a lower rate, rather than delaying until the electrolyte imbalances are corrected. Mehanna et al (2008) suggest that adherence to the NICE guidelines should reduce the incidence and associated complications of the syndrome. However it is acknowledged that more research and randomised control trials into RFS are required to improve the management and potential mortality of this condition (Mehanna et al 2008, Hearing 2004).

Conclusion

Lack of awareness of this condition is evident, therefore this article will hopefully have achieved something in accomplishing that. ANP's are in constant involvement of the care of acutely unwell adults who are often also undernourished through disease process or life style choices. Improving patients' nutritional state should be paramount, but caution on how this is achieved should be of the utmost consideration to avoid iatrogenic harm to patients. The use of nutritional teams and early assessment of those patients at risk should be integral to care (Khan et al 2011). High index of suspicion of RFS and the recognition that this condition is potentially lethal should be the principal process to prevent morbidity and in some cases death, by careful management of diet, vitamin intakes and electrolyte and fluid balance (Fung & Rimmer 2005).

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Ventricular Assist Devices

Linda Nesbitt, Cardiothoracic Nurse Practitioner, Golden Jubilee National Hospital

Background

Heart failure within the UK affects around 1% of the population and this incidence only increases with age. The number of patients therefore living with a diagnosis of heart failure is predicted to increase greatly over the coming decades due to improved survival rates following cardiac events and improved medical management of this condition (National Heart Failure Audit 2011). For those patients who suffer from severe heart failure it is widely accepted that cardiac transplantation offers the most effective treatment option for patients who are suitable to undergo this. Unfortunately the number of available donor hearts within the UK and Europe has shown a steady decline in recent years which can be correlated to the introduction of safety measures such as the use of seat belts, crash helmets and speed cameras (Birks 2010). This situation therefore leaves many of these patients facing a poor prognosis as they may have little hope of achieving a transplant in time to save their lives. As a result of this, additional treatment options for the treatment of this patient group have been developed.

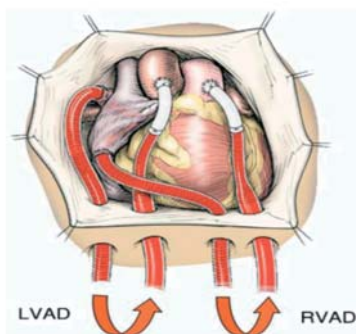
Development of VAD's

Mechanical circulatory support although in existence since the 1960's has developed greatly over time. During the early use of VAD's, pulsatile pumps were initially developed that mimicked the natural action of the heart; these devices were commonly known as 1st generation VADs.

More recently continuous flow pumps have now been developed which has allowed the design of the pump to be simplified leading to VAD's being much smaller and more reliable. These initial continuous flow devices were referred to as 2nd generation VADs. Further development has continued allowing the number of moving parts within the pump to be reduced to a single moving part and this type of pump is commonly referred to as a 3rd generation VAD.

A side effect of having a 2nd or 3rd generation VAD's implanted is that the patient will not have a pulse, their blood pressure will not be able to be measured by standard equipment and oxygen saturations measured by pulse oximetry may be difficult as the pulse intensity will be seriously reduced (Garbade et al 2011).

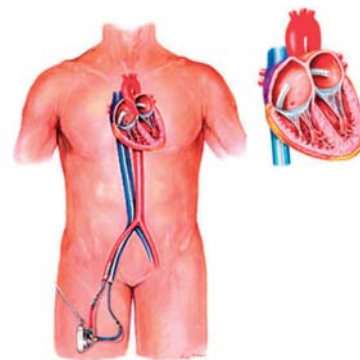
A VAD is not a replacement for the heart but a mechanical pump that can be implanted to help the heart's weakened ventricle pump blood throughout the body. Blood flows from the ventricle into the pump. A left ventricular assist device (LVAD) receives blood from the left ventricle and delivers it to the aorta. A right ventricular assist device (RVAD) receives blood from either the right atrium or right ventricle and delivers it to the pulmonary artery. Although Left Ventricular assist devices (LVAD) are the most commonly used device, Right Ventricular (RVAD) devices can be used when or if indicated and when both an LVAD & RVAD are used in combination this is referred to as a Biventricular assist device (Bi-VAD)



Types of VAD's

There are two main types of VAD's –short term & long term Short term VAD's as the name would suggest are used as circulatory support for a period of days to a few weeks only and generally these VAD's have their pump situated outside the body and require the patient to be cared for in a critical care area in hospital.

Most patients who are considered for short term VADS are generally patients who are acutely unwell as a result of an acute onset cardiac event or a known heart failure patient no longer responding to conventional heart failure management and due to their current state could not be considered for a cardiac transplant or long term VAD at that time.

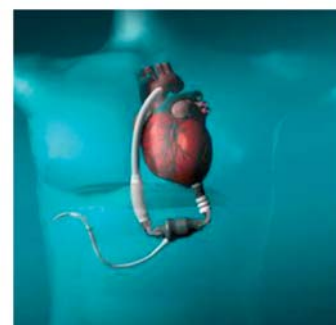


Short term VAD's are used for 5 main reasons:

- To provide a lifeline to sudden onset critically ill patients who may have multi-system failure and who may die imminently without intervention. A short term VAD can provide a period of stability, support and time for the most appropriate treatment decisions to be taken, in this case the short term VAD acts as a **bridge to decision**
- To keep acutely unwell patients alive until a donor heart can be found for transplantation. If this is the case, the VAD is used as a **bridge to transplantation**.
- To allow the heart the possibility to recover some of its normal function and the possibility of the device to be explanted thus cardiac transplantation may not be required. In this situation the VAD is used as a **bridge to recovery**.
- In patients who have had a cardiac transplant and the donor heart shows some signs of failure post transplantation a short term VAD may be implanted to **support the new donor heart**.
- In patients who having had a short term VAD and are not suitable for transplantation at that time or ever a long term VAD will be considered. In this way the short term VAD acts as a **bridge to a long term VAD**

(National Waiting Times Centre-GJNH 2011)

Long term VAD's are intended for use for a much longer period of time and these devices are implanted within the body beside the heart. The internal pump is placed in the left lower chest, generally under the left rib cage. A percutaneous cable, (often referred to as the 'drive line') comes through the abdominal wall, connecting the internal pump to the external controller, which is connected to a power supply (batteries or AC-power). The controller is an essential part of the device as it contains the settings, alarms and diagnostic information about the pump.



Long term LVAD

Following successful implantation of a long term VAD and training of both the patient and their family in relation to the management of their device, most patients will be able to go home and experience a relatively good quality of life.

The use of long term VADS within the UK are for 2 main reasons:

- As a method of improving/stabilising the clinical state of a patient awaiting cardiac transplant therefore the VAD acts as a **bridge to transplant**.
- In some cases of acute onset heart failure the implantation of a long term VAD allows the heart to recover fully which leads to a successful explant of the device. In this case the long term VAD acts as a **bridge to recovery**.

There is another use for a long term VAD which is termed '**destination therapy**'.

The goal of destination therapy is to support the patient's cardiac function and improve the quality of life for the rest of the patient's life when cardiac transplantation or cardiac recovery will not be possible. In some countries such as America and Germany this treatment option is being made available to patients and the long term survival of this patient group continue to improve. At present within the UK as a whole, long term VAD's are not being offered or used for this purpose primarily due to the high financial costs however in light of the sparsity of available hearts for transplantation this is an area which will be continually reviewed.

(National Waiting Times Centre-GJNH 2011)

Complications of VAD's

Although VAD therapy, both short & long term offer a lifeline to those patients with advanced heart failure or acute onset heart failure this therapy is not without potentially serious complications. One major risk is that of thrombo-embolism which can lead to vascular complications, stroke or myocardial infarction secondary to potential clot formation from the pump however the incidence of this has reduced markedly since the introduction of continuous flow pumps with minimal moving parts and on-going anti-coagulation. All patients with any VAD in situ will be on anti-coagulation medication of either heparin (short term VAD) or warfarin therapy (long term VAD) therefore can also be at an increased risk of bleeding. One of the most commonly seen complications of VAD therapy however remains infection especially emanating from the drive line therefore it is imperative that VAD recipients are well educated to act quickly at the first signs of possible infection and to seek medical attention early (Krabatsch et al 2011).

VAD's in Scotland

The VAD programme in Scotland began in The Golden Jubilee National Hospital in 2010. Since then 18 patients with acute onset heart failure have been treated initially with short-term VAD's as a '**Bridge to decision**'. Of this group 10 patients had BiVAD's implanted, 4 patients had LVAD's and 4 patients received VAD-ECMO. The outcomes of these patients were as follows:

13 (72.2%) bridged to explantation, transplantation or long term support

1 Bridged directly to transplantation after 12 days of support

4 Bridged to Long-term VAD support (Heartmate II LVAD)

9 Bridged to explantation

2 Subsequently died (1 after explantation and 1 after bridge to long-term support)

Unfortunately **5 patients (33.3%)** died within 30 days of support

1 Haemorrhagic stroke

2 Multi-organ Failure and Sepsis

2 Bowel ischaemia, acute limb ischaemia and Multi-organ failure secondary to heparin-induced thrombocytopenia

(Haj- Yahia 2013)

In relation to the long term VAD's the outcomes to date are as follows:

15 patients in total have been treated with long term VAD's

7 patients (47%) have unfortunately died (as detailed above)

3 patients (20%) successfully explanted

5 patients (33%) with long term VAD 's in situ and awaiting transplantation.

(Haj- Yahia 2013)

Although the mortality rate may appear high in both long & short term VAD therapy the statistics within Scotland are equivalent or even slightly better than the European statistics.

The Future

VAD therapy has been proven to be a successful treatment for patients with advanced heart failure and acute onset heart failure. It is therefore imperative that those patients who may be suitable for this treatment option are identified early and the Advanced Heart Failure Unit at the Golden Jubilee contacted in relation to the patient's suitability.

The use of VAD therapy continues to expand and develop as does the development of new VAD's. Currently, new technology is undergoing clinical trials in relation to the use of fully implantable devices which would be able to be charged and controlled trans-cutaneously and easier to implant. This apart from being much more cosmetically acceptable for the patient would reduce the risk of infection markedly (Garbade et al 2011). Whilst it is accepted that this new technology may be financially costly – it is hopeful that this treatment option will continue to be supported by government policy to provide heart failure patients both now and in the future with access to this life saving therapy.

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ACAP Scotland 4th National Conference

Grand Central Hotel

Friday 1st November 2013

08:30 -09:00	Registration & coffee
09:00-09:15	Welcome – David Hunter
09:15-09:55	Martin Carberry & Pauline Clements— Rescuing the deteriorating patient: a nurses perspective

Master-Classes 10:00—10:35

MC 1	Amy Drewery – Chest drain management – Interactive workshop
MC 2	Scott Oliver Case studies – interactive workshop

Master-classes—10:40—11:15

MC 1	Amy Drewery – Chest drain management – Interactive workshop
MC 2	Scott Oliver Case studies – interactive workshop

Coffee 11:15—11:30

11:35-12:10	Karen Leighton & Noreen McMahon – ANP role within the respiratory setting
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Lunch 12:15 – 13:00

13:05-13:45	Craig Stobo, - FEAT : Family Perspective on Sepsis
13:50-14:30	Ronnie Dornan – Outreach Service Development

Coffee 14:35 – 14:55

15:00:- 15:40	Dr Alan Japp – Heart Failure
15:45:-16:30	Pennie Taylor – Leadership and Motivation
16:35- 16:45	David Hunter – Closing Remarks



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