

Performing cardioversion in a pharmacist-led clinic

Sandra Allan is a specialist cardiac pharmacist at The Luton and Dunstable Hospital NHS Foundation Trust. She performs electrical cardioversion on patients with atrial fibrillation and flutter. This article describes her unique clinical role. By Shona Kirk.

Sandra Allan has been a cardiac pharmacist at The Luton and Dunstable Hospital NHS Foundation Trust for about 10 years. She has been an independent prescriber since 2007 and has been running an arrhythmia clinic since completing her non-medical prescribing qualification (a Sharing Practice article on p56 describes the benefits of this clinic).

Establishment of the arrhythmia clinic, which was carried out alongside her clinical governance lead and consultant cardiologist, Neil Marcus, led Mrs Allan to set up a cardioversion service for patients with AF and atrial flutter. She has been carrying out electrical cardioversion since 2008.

The procedure

The cardioversion team comprises Mrs Allan, an anaesthetist, and the nursing staff in the recovery room and medical day unit.

Mrs Allan developed a protocol for electrical cardioversion using guidelines from the National Institute for Health and Clinical Excellence and the American College of Cardiology.^{1,2}

What is cardioversion?

Cardioversion can be used to treat cardiac arrhythmias.

The procedure involves administering a brief and calibrated electric shock across the heart. This depolarises the heart and eliminates the abnormal rhythm. The shock is delivered across the chest wall using two external electrodes.

The patient's cardiac rhythm is monitored so that the shock can be delivered at a safe point in the cardiac cycle.

The patient receives cardioversion under general anaesthesia.



Sandra Allan performs electrical cardioversion in patients with atrial fibrillation

The procedure is performed under general anaesthetic using published monitoring recommendations for anaesthesia and cardioversion.³

The anaesthetist administers the anaesthetic and indicates when the patient is ready, then Mrs Allan delivers the shock using the defibrillator. "Guidelines provide us with suggested electrical energy levels for cardioversion of AF and flutter," she says. "Traditionally defibrillator energy was started low and successively increased, but high initial energy has been shown to be more effective, resulting in fewer shocks and less cumulative energy.¹ We generally start with 200J biphasic energy for AF and 50J for flutter. We use a lower energy for small or frail patients, and when the electrocardiogram (ECG) shows a particular course of AF that we know to be recent in onset," says Mrs Allan.

Mrs Allan's cardioversion service has a success rate of 97%, as measured by the number of patients who return to sinus rhythm 'on the table'. Very few patients require more than a single shock.

Patients are monitored in the recovery unit for about 30 minutes after the procedure. When they are fully conscious and able to transfer to a wheelchair, they are taken to the day unit. They remain on the day unit for about another hour, for further monitoring. "They have to reach a set blood pressure and heart rate before they can be discharged, but our aim is to send all patients home by 1pm," says Mrs Allan.

Training

Mrs Allan undertook a number of training courses before beginning to perform cardioversions. Her independent prescribing training involved cardiac

clinical assessment skills, ECG interpretation and arrhythmia management. Taking on the cardioversion service required some additional practical skills including venepuncture and cannulation. Mrs Allan also needed to pass an 'intermediate life skills' assessment to use the defibrillator, and to allow her involvement in the care of patients who have received a general anaesthetic. Training was also required, according to trust policy, to obtain patient consent for the cardioversion procedure.

Pre-assessment

A pre-assessment is required two days before the cardioversion procedure itself. "This is key to the smooth running of the 'list' on the day of the cardioversion procedure," says Mrs Allan. During this assessment, Mrs Allan carries out a number of checks to ensure that the patient is suitable for cardioversion. This includes an ECG, and blood tests for the international normalised ratio (INR) and potassium levels.

The patient's referral history is also reviewed to determine the likely aetiology of their AF or flutter, any previous cardioversions, and anti-arrhythmic use. "We look at things that might affect the success of the cardioversion, such as ECG parameters, thyroid status and length of time in AF," explains Mrs Allan. She says that NICE provides good guidance about which patients are suitable for cardioversion.²

Mrs Allan reviews the patient's medical history to identify other risk factors for AF recurrence, and assesses the risk of stroke risk using the CHADS₂ score.

Mrs Allan also conducts a review of the patient's current medication. "Some patients take drugs that may worsen their AF, such as anticholinergics, and others may need anti-arrhythmic medication initiated or increased. All patients need to be on warfarin for the procedure and digoxin is always stopped before cardioversion," she says.

The findings from the pre-assessment day are used to review the risks and benefits of the procedure with the patient, before obtaining the patient's signature for consent.

Mrs Allan then performs a basic cardiovascular examination to make sure that the patient is not acutely unwell, which would require the procedure to be postponed. This includes checking the

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patient's pulse rate, temperature, blood pressure, jugular venous pressure. She also performs a chest auscultation.

Independent prescribing

Mrs Allan says that the advantages of being an independent prescriber are most apparent during the pre-assessment stage of the cardioversion procedure. "Being an independent prescriber allows me to optimise the patient's medication for the cardioversion. This can involve anything from prescribing oral potassium for a few days before the procedure (since cardioversion is contraindicated in hypokalaemia) to initiating or increasing anti-arrhythmic drugs, optimising anti-hypertensive or heart failure medication, and altering warfarin dosages (since the most common reason for postponement of cardioversion is an INR out of the 'safe' range)."

Mrs Allan says that being an independent prescriber means that she can also intervene soon after a patient's cardioversion, if necessary. She explains that NICE guidance suggests that patients should be reviewed four weeks after cardioversion, but the majority of patients do not have the opportunity to see the consultant until three to four months after cardioversion. "If I think the patient needs to be seen earlier, I can see them in my pharmacist-led arrhythmia clinic (PAC)," says Mrs Allan. "For example, a common occurrence after cardioversion is increased PR interval (first degree heart block). I can see these patients within a few days if necessary, to check that the problem has resolved or, if necessary, stop drugs that may worsen the problem such as beta-blockers. For many patients, I use this flexibility to increase their anti-arrhythmic dose to optimise their chances of maintaining sinus rhythm," she explains.

All patients who undergo cardioversion are given an 'aftercare sheet' with a contact number for Mrs Allan. They are told that they can call her if their AF symptoms, such as shortness of breath or palpitations, return. This means that patients do not need to wait three to four months for a follow-up appointment with the consultant. "I can discuss patient cases with the consultant and then see these patients in the PAC to implement rate control medication or change the anti-arrhythmic before another attempt at cardioversion," she says. "I suspect that this reduces readmission rates but we have not yet collected data to support this."

Rewards and benefits

Implementation of an independent pharmacist-led cardioversion service has led to a number of improvements for patients. Mrs Allan says that before the AF clinic began, patients had to wait for up to nine months for cardioversion. "Research has shown that cardioversion for AF is more likely to be successful if performed within 12 months of arrhythmia onset, and ideally within three months," she says.¹ "The waiting list is now down to a week." Mrs Allan explains that the list for cardioversion allows for up to seven procedures per week, although the average is three.

Mrs Allan set up the day case cardioversion service. This involved securing cardiology funding for her and the anaesthetist's time, finding a suitable place to carry out the cardioversions, negotiating space and nursing support for the pre-assessment clinic and recovery in the day unit, and securing dedicated anaesthetist time.

The cardioversion procedure is carried out in the recovery ward of the main theatres unit at the trust. Mrs Allan points out that, previously, cardioversion was an inpatient procedure that was performed in the coronary care unit. "The old system was expensive and inefficient with many cancellations. These usually resulted from one of three reasons — no bed available when the patient arrived, problems with the INR, or no anaesthetist available." Mrs Allan says that most of these problems have been resolved with the new service.

She says that cancellations because of INR problems can still be an issue, often because patients' INRs need to be in range

(2.0–3.0) for four weeks before they can undergo cardioversion.

The most rewarding aspects of the role are direct patient care and receiving immediate feedback, says Mrs Allan. “This is a result of my independent prescribing qualification. My role is no longer about advising someone to do something, but is about doing it myself.” She says that the learning process is fast because she receives direct feedback on everything she does within weeks.

Mrs Allan has not experienced any medical or clinical barriers to the cardioversion service. “I am extremely well supported by the consultants. As far as I can tell they are delighted with the service,” she says.

Challenges

Mrs Allan points out that cardioversion is not without risks. She says: “Although I have cardiologist back-up, I still need to know when to call him.” Mrs Allan says

that during the past two years, there have been 10 incidents during or shortly after the cardioversion. The incidents have included junctional rhythms, stroke and transient ischaemic attack, and persistent bradycardia. Mrs Allan remains on site and takes responsibility for these patients until they are admitted. “I have to be constantly aware of my competence and limits. They are very well documented. I know exactly when I have to call the consultant but I still need to be able to identify when there is a problem. This is the most challenging part for me.”

Sometimes patients are referred for cardioversion but decide not to undergo the procedure. “Some patients just change their minds,” says Mrs Allan. “They agree to the referral, then have time to read and think about it. They often come to clinic with specific questions such as ‘Why do I need cardioversion?’ or ‘What will happen if I do not have this done?’. Making sure that the patient is aware of the risks,

benefits and alternatives to the treatment is part of the consent procedure, and sometimes they decide the benefits are not worth the risk.”

References

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