SYMPTOMATIC BRADYCARDIA 2: ASSESSMENT AND MANAGEMENT

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This is the second in a two-part unit on managing bradycardia. Part 1 discussed the physiology of the condition and examined its main causes. This second part outlines adverse signs, drug treatment options, transcutaneous pacing and nursing care.

As identified in part 1, many patients may be bradycardic or demonstrate any of the different types of heart block but be totally asymptomatic. A patient assessment must be carried out to establish if there are any adverse signs that require prompt intervention to prevent further deterioration. Assessment should be carried out using the ABCDE (airway, breathing, circulation, disability, exposure) approach as advocated in advanced life support courses (Resuscitation Council UK, 2006; Smith, 2003). Any remedial action such as oxygen therapy, IV access and analgesia should be carried out when the problem is identified. Practitioners should be vigilant for several key features or adverse signs when managing patients with heart block (Box 1).

LEARNING OBJECTIVES
1. Be able to discuss the pharmacological management options for treating bradycardia.
2. Know the indications for transcutaneous pacing and how to initiate it.

ADVERSE SIGNS
A systolic blood pressure less than 90mmHg is considered an adverse sign. A BP below this is likely to result in diminished organ perfusion to essential organs such as the kidneys, liver and brain as well as the heart.

Furthermore, as cardiac output is derived from both stroke volume and heart rate, a significant drop in heart rate can result in a drop in BP, resulting in ischaemic events. Another adverse sign is a heart rate under 40 beats per minute. While bradycardia is distinguished as below 60 beats per minute in adults, many patients will be totally asymptomatic and it may be physiologically normal for them. However, very few patients will have a natural rate under 40, and the majority of them will be symptomatic.

Ventricular arrhythmias are common in patients with profound bradycardia. As the heart rate decreases, cardiac output will fall unless patients are able to compensate. The drop in BP may result in poor perfusion to the heart and other organs.

Due to diminished perfusion, the cardiac cells can become hypoxic and, as such, irritable. An irritable myocardium can easily start to initiate ectopic beats or generate tachyarrhythmias such as ventricular tachycardia. If patients demonstrate frequent or an increasing number of ventricular ectopic beats, remedial action is indicated. Due to decreased heart rate and reduced cardiac output, the heart’s pump mechanism is essentially becoming ineffective. As a consequence, patients may begin to display signs of heart failure.

An increased respiratory rate may be a natural response in an attempt to maximise oxygenation but may also be a result of developing heart failure.

Experienced practitioners should listen to the patients’ chest to identify the presence of any fluid, indicating possible failure. The new presence of heart failure would be an indication for remedial treatment.

TREATMENT OPTIONS
If any of these adverse signs are present, prompt action is required.

Atropine sulphate is the most popular choice for immediate intervention. Atropine has a role in the emergency management of symptomatic bradycardia (British Medical Association and Royal Pharmaceutical Society of Great Britain, 2007; RCUK, 2006). Some patients respond well to small doses, so incremental doses are used to minimise the risk of developing excessive tachycardia. The RCUK (2006) identified acute myocardial infarction as a relative contraindication.

The RCUK also identified alternative drugs such as aminophylline, glucagon and dopamine as potential treatments to correct bradycardia.

Aminophylline is a member of the methylxanthines. While it is predominantly used in managing respiratory disease, it has cardiovascular side-effects which can be beneficial in certain circumstances. It stimulates the heart, having both a chronotropic effect and an inotropic effect (Rang and Dale, 2007). Schulz-Stübner (2005) discussed several case studies where aminophylline (containing theophylline) was used effectively for treating symptomatic bradycardia. However, it was only used after atropine had been transiently successful.

Glucagon also increases myocardial contractility. Love et al (1998) argued that glucagon may be beneficial where atropine has been ineffective, and still advocated atropine as first-line management.

Hayes (2004) discussed the use of dopamine as an interim measure until transvenous pacing can be achieved. It
has a strong sympathetic action on the heart and peripheral blood vessels, hence its possible use in sustaining adequate cardiac output until more definitive action can be taken.

**TRANSCUTANEOUS PACING**

Transcutaneous pacing is indicated for patients in whom pharmacological interventions have failed to correct the arrhythmia. It should be noted that all attempts should be made to correct any possible underlying cause wherever possible, such as hypoxia.

Transcutaneous pacing is relatively quick and simple to initiate once practitioners recognise the need for it. It can be performed by nursing staff trained in its use.

Altamura and Toscano (2007) found temporary cardiac pacing to be a reliable and non-invasive treatment method that can be initiated rapidly, and advocated it as first-line management in patients with adverse signs. For maximum benefit, it should be initiated promptly on recognition of the arrhythmia.

Transcutaneous pacing works by acting as an artificial pacemaker. Here, two adhesive electrode pads are attached to the chest wall. To ensure maximum effectiveness, the chest wall should be prepared before attaching the electrode pads. Scissors or a razor should be used to remove any excess chest hair quickly from the areas on which the pads will be placed (RCUK, 2006). Having done this and ensured the surface of the skin is dry, practitioners should apply the pads, ensuring no air is trapped on application. Ideally the anterior-posterior position should be adopted where possible (RCUK, 2006).

While some machines do not require additional monitoring, many require the leads to be applied to allow monitoring of the underlying rhythm and this is good practice (Jevon, 2007).

Practitioners should ensure all cables are attached and the machine pacers is switched on. They will need to select the appropriate mode for pacing (demand or fixed), set the desired rate and select the pacing current.

If pacing is effective, full patient assessment should be carried out and prompt assistance from expert staff obtained as transvenous pacing will be required.

Consideration should be given to analgesia as some patients will experience discomfort, which increases with the current required.

Practitioners should familiarise themselves with the type of pads available in the clinical areas where they work, as many can also be used for defibrillation if required.

**NURSING CARE**

Patients with symptomatic bradycardia can be very unwell and will have both physical and psychological needs.

They may be feeling anxious and will require reassurance about their condition and management plan. Patients may feel empowered by being kept informed about their condition. They may have anxieties because of the underlying cause, such as acute MI, and these need to be addressed.

Patients may be very distressed because of the machinery around them, each with a multitude of alarms. The need for each piece of equipment should be explained as this may reduce anxiety. Consideration should also be given to alarm settings and volume, although practitioners must always ensure the alarm is sufficient to alert staff.

Symptomatic patients may be confused, possibly as a result of hypoxia or hypotension. They are at an increased risk of inadvertently hurting themselves, possibly by dislodging IV access or falling out of bed. Consideration should be given to the level of nursing required.

Patients’ physical needs are varied. Those attached to external pacing equipment will need assistance with washing and dressing. They may be extremely anxious about even attempting this, for fear of exacerbating their condition.

Passing urine will also be an issue and patients will require assistance. In many cases a urinary catheter is inserted. This serves two purposes – it helps patients to eliminate and also allows practitioners to monitor urine output closely, to see whether perfusion of the kidneys is maintained.

In patients having oxygen therapy, the mouth can become dry very quickly. Regular attention should be paid to oral hygiene.

**CONCLUSION**

Symptomatic bradycardia can be challenging to manage. Guidelines in clinical practice can assist practitioners in making decisions about care delivery and prescribing.

Regardless of patients’ presentation, initial assessment and management is the same. Assessment should be carried out using the ABCDE approach. Supportive therapy through oxygen delivery and IV access should be achieved promptly if required. Early referral for expert advice should be initiated as quickly as possible to maximise care delivery.

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**KEY REFERENCES**


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