TABLE 1. SYSTEMS AFFECTED BY PRIMARY HYPERPARATHYROIDISM

<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>CAUSE</th>
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<tbody>
<tr>
<td>Cardiac (angina, myocardial infarction, arrhythmias)</td>
<td>Deranged calcium, phosphate and magnesium levels that occur in the condition, affecting the myocardium</td>
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<tr>
<td>Renal (calcium calculi)</td>
<td>High serum calcium levels are removed by the kidneys. Often polydipsia and polyuria is present in an attempt to remove the excess calcium, which can lead to dehydration. This occurs in 20-30% of patients and is a common symptom. Patients are often diagnosed with primary hyperparathyroidism after admission with renal colic (Fraser, 2009)</td>
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<tr>
<td>Gastrointestinal</td>
<td>Dehydration can lead to constipation and nausea. Acid secretion increases leading to epigastric pain. This can go on to cause peptic ulcer disease (Inabnet et al, 2008)</td>
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<tr>
<td>Skeletal</td>
<td>Excess parathyroid hormone causes skeletal changes such as osteoporosis and pathological fractures. Patients initially presenting with these symptoms are rare; however, osteoporosis is present in 44% of patients that are referred for surgery (Mazzaglia et al, 2008)</td>
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<tr>
<td>Neuropsychiatric</td>
<td>Depression and anxiety is a common symptom, which relates to raised serum calcium levels (Fraser, 2009). Serum calcium levels of &gt;3.5mmol/L are known to cause confusion, psychosis and even coma (Lewis, 2009)</td>
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has the advantage of requiring less time under anaesthetic, which can be particularly useful when treating older patients; it also requires less time in hospital and better recovery. Several methods can be used, such as:

- Ultrasound;
- Computerised tomography;
- Magnetic resonance imaging;
- Sestamibi scans (EndocrineSurgeon.co.uk, 2010b).

Intraoperative assays of intact PTH can be useful to determine if all affected glands have been removed. Because PTH levels fall rapidly, testing while the patient is still under anaesthetic can be a reliable method of determining whether the problematic gland has been removed (Fraser, 2009).

Some specific complications can arise as a result of parathyroidectomy. In less than 1% of cases, paralyis of the vocal cords or damage to the laryngeal nerve can occur, while postoperative bleeding occurs in one in 750 cases.

A more common complication is severe hypocalcaemia, known as hungry bone syndrome (HBS), which is present in 42% of cases (Mittendorf et al, 2004). This is more common in patients who have large parathyroid adenomas, are over 60 years of age and have high preoperative levels for calcium, PTH and phosphatase. In HBS, removal of the enlarged parathyroid gland reduces the amount of PTH released into the vascular system. This subsequently increases the uptake of calcium into the bones causing hypocalcaemia, and often requires calcium supplementation (Mittendorf et al, 2004).

PREOPERATIVE NURSING CARE IN ELECTIVE SURGERY

For many, parathyroidectomy can be done as an elective day case, depending on the patient’s coexisting problems. Most patients need only a preoperative assessment before surgery. This involves taking routine nursing observations, which give a postoperative baseline, preparing patients for theatre and offering psychological support and information about what to expect.

Preoperative care for patients in crisis

It is important to be able to plan and implement nursing care for those in crisis. This should be based on a holistic assessment, while taking into account the specific challenges, so knowledge of pathophysiology is vital. This can be an extremely frightening time for the patient and family members, and nurses must be empathetic and provide psychological support to all concerned.

Nurses have a vital role in haemodynamic monitoring and fluid balance measurement to ensure patient safety. Their extended role in some acute areas may involve ordering blood tests; daily bloods should be taken for calcium, urea and electrolytes, and for phosphates in the postoperative period.

Using a track and trigger monitoring system, such as a modified early warning system (MEWS), is an essential part of the nursing role. NICE (2007) suggests that patients in acute settings have the frequency of their physiological observations prescribed by medical staff, tailored to their individual condition. Recording and reporting of observations outside normal parameters is vital, as high calcium levels can affect cardiac rhythm. It is therefore essential to feel for a pulse manually, rather than rely on electronic equipment that only provides rate measurement (Boulanger and Toghill, 2009).

As patients can be very dehydrated, the monitoring of observations can help to determine levels of hydration. While low blood pressure can be an indication of dehydration, nurses should also observe for rapid pulse rates because the body tries to compensate for the reduction in circulating fluid by increasing the heart rate (Scales and Pilsworth, 2008). The pulse may also be weak and this vital information would be missed if only electronic equipment was used (Boulanger and Toghill, 2009).

Fluid balance is an essential part of care, especially when patients present in crisis. While documenting all input and output is important, observing urine colour can also be useful. Dark urine is a sign of dehydration, as the body releases antidiuretic hormone to prevent further loss of fluid from the renal tract (Tortora and Derrickson, 2009). It is also important to ensure patients do not retain too much fluid, as this can lead to cardiac problems and fluid overload.

Many patients are unable to supplement their oral intake with enough fluids for adequate diuresis, so will require IV infusions. The site of the cannula should be observed to ensure the fluids are running to prevent dehydration. All cannulas should be monitored and changed regularly; national guidelines advocate changing the cannula every 72 hours (Royal College of Nursing, 2010; Department of Health, 2007), but a recent Cochrane review (Webster et al, 2010) suggests the evidence to support this is weak and recommends that cannulas be changed on clinical indication.

POSTOPERATIVE NURSING CARE

Haemodynamic monitoring, including fluid balance, is vital in the postoperative period. It is important to remember that pain control and wound care also require consideration.

For patients undergoing elective surgery, discharge on the same day with strong analgesia is possible, while those who have had surgery following crisis – especially if thoracic surgery was required – can be provided with patient controlled analgesia (PCA). The importance of physiological monitoring for patients on PCA cannot be