<table>
<thead>
<tr>
<th>Modality of care</th>
<th>Parameter</th>
<th>Observer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;10</td>
<td>20-69</td>
</tr>
<tr>
<td>Level of consciousness</td>
<td>54 09 - - - - - -</td>
<td>45 45 16 - - - - - -</td>
</tr>
<tr>
<td>Pupils</td>
<td>- 11 28 60 - - - - -</td>
<td>- 22 8 22 22</td>
</tr>
<tr>
<td>Limbs</td>
<td>60 24 - - - - - -</td>
<td>50 - - - - - -</td>
</tr>
<tr>
<td>Central nervous system</td>
<td>100 - - - - - -</td>
<td>100 - - - - - -</td>
</tr>
<tr>
<td>Blood pressure</td>
<td>- 20 45 20 - - - - -</td>
<td>- 10 10 10 - - - - -</td>
</tr>
<tr>
<td>Pulse</td>
<td>66 86 10 30 66</td>
<td>66 65 18 - - - - -</td>
</tr>
<tr>
<td>Respiration</td>
<td>11 61 8 11 11</td>
<td>60 60 18 18</td>
</tr>
<tr>
<td>Temperature</td>
<td>- 59 45 - - - - -</td>
<td>- - - - - -</td>
</tr>
<tr>
<td>Eye movement</td>
<td>83 17 - - - - -</td>
<td>60 - - - - - -</td>
</tr>
<tr>
<td>Cerebrospinal fluid</td>
<td>76 89 - - - - -</td>
<td>- - - - - -</td>
</tr>
<tr>
<td>Blood sugar level</td>
<td>39 97 18 - - - - -</td>
<td>- - - - - -</td>
</tr>
<tr>
<td>Urological care</td>
<td>93 86 - - - - -</td>
<td>- - - - - -</td>
</tr>
<tr>
<td>Change of position</td>
<td>0 60 - - - - -</td>
<td>0 - - - - - -</td>
</tr>
<tr>
<td>Communication</td>
<td>100 - - - - - -</td>
<td>- - - - - -</td>
</tr>
<tr>
<td>Communication II</td>
<td>100 - - - - - -</td>
<td>- - - - - -</td>
</tr>
<tr>
<td>Mobility</td>
<td>20 40 - 40 - - - - -</td>
<td>30 30 - - - - -</td>
</tr>
<tr>
<td>Exercise therapy</td>
<td>100 - - - - - -</td>
<td>- - - - - -</td>
</tr>
<tr>
<td>Medications and stimuli</td>
<td>- - - - - -</td>
<td>- - - - - -</td>
</tr>
<tr>
<td>General</td>
<td>100 - - - - - -</td>
<td>100 - - - - - -</td>
</tr>
<tr>
<td>Anxiety</td>
<td>30 - - 30 - - - - -</td>
<td>30 - - 30 - - - - -</td>
</tr>
<tr>
<td>Tard</td>
<td>100 - - - - - -</td>
<td>100 - - - - - -</td>
</tr>
<tr>
<td>Position of independence</td>
<td>00 40 - - - - -</td>
<td>30 30 - - - - -</td>
</tr>
</tbody>
</table>

OBSERV.

50 41 16 12 2 - 06 20 17 10 4 1
### Table 5: A comparison of the observers' percentage of action care received per modality per range (weighted mean of care)

<table>
<thead>
<tr>
<th>Modality of care</th>
<th>Percentage</th>
<th>&lt;50</th>
<th>50-60</th>
<th>60-80</th>
<th>80-100</th>
<th>&gt;100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of consciousness</td>
<td></td>
<td>71</td>
<td>20</td>
<td>11</td>
<td>21</td>
<td>60</td>
</tr>
<tr>
<td>Pupils</td>
<td></td>
<td>85</td>
<td>34</td>
<td>6</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>Limbs</td>
<td></td>
<td>67</td>
<td>30</td>
<td>12</td>
<td>16</td>
<td>22</td>
</tr>
<tr>
<td>Position of body</td>
<td></td>
<td>69</td>
<td>34</td>
<td>16</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>Blood pressure</td>
<td></td>
<td>74</td>
<td>28</td>
<td>12</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Pulse</td>
<td></td>
<td>91</td>
<td>50</td>
<td>15</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Pupil size</td>
<td></td>
<td>114</td>
<td>50</td>
<td>15</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Temperature</td>
<td></td>
<td>64</td>
<td>35</td>
<td>15</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Gastrointestinal sound</td>
<td></td>
<td>47</td>
<td>28</td>
<td>12</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Oropharyngeal sound</td>
<td></td>
<td>78</td>
<td>38</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Bronchial lobe</td>
<td></td>
<td>93</td>
<td>50</td>
<td>15</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Oropharynx</td>
<td></td>
<td>93</td>
<td>50</td>
<td>15</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Ear</td>
<td></td>
<td>93</td>
<td>50</td>
<td>15</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Throat</td>
<td></td>
<td>93</td>
<td>50</td>
<td>15</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Nasal passages</td>
<td></td>
<td>93</td>
<td>50</td>
<td>15</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Gastrointestinal section</td>
<td></td>
<td>93</td>
<td>50</td>
<td>15</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Nasal section</td>
<td></td>
<td>93</td>
<td>50</td>
<td>15</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Oropharynx</td>
<td></td>
<td>93</td>
<td>50</td>
<td>15</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Eyes</td>
<td></td>
<td>62</td>
<td>28</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Membrane</td>
<td></td>
<td>62</td>
<td>28</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Skin</td>
<td></td>
<td>62</td>
<td>28</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>External auditory canals</td>
<td></td>
<td>62</td>
<td>28</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Internal auditory canals</td>
<td></td>
<td>62</td>
<td>28</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Middle ear</td>
<td></td>
<td>62</td>
<td>28</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>External ear</td>
<td></td>
<td>62</td>
<td>28</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Ossicles</td>
<td></td>
<td>62</td>
<td>28</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Intracranial region</td>
<td></td>
<td>62</td>
<td>28</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Skull</td>
<td></td>
<td>62</td>
<td>28</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Motor activity</td>
<td></td>
<td>62</td>
<td>28</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Coordination</td>
<td></td>
<td>62</td>
<td>28</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Speech</td>
<td></td>
<td>62</td>
<td>28</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Gross motor</td>
<td></td>
<td>62</td>
<td>28</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Fine motor</td>
<td></td>
<td>62</td>
<td>28</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Communication</td>
<td></td>
<td>62</td>
<td>28</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Overall</td>
<td></td>
<td>62</td>
<td>28</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
</tbody>
</table>

### Table 5.1: A comparison of the observers' percentage of action care received per modality per range (weighted mean of care)

<table>
<thead>
<tr>
<th>Modality of care</th>
<th>Percentage</th>
<th>&lt;50</th>
<th>50-60</th>
<th>60-80</th>
<th>80-100</th>
<th>&gt;100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of consciousness</td>
<td></td>
<td>71</td>
<td>20</td>
<td>11</td>
<td>21</td>
<td>60</td>
</tr>
<tr>
<td>Pupils</td>
<td></td>
<td>85</td>
<td>34</td>
<td>6</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>Limbs</td>
<td></td>
<td>67</td>
<td>30</td>
<td>12</td>
<td>16</td>
<td>22</td>
</tr>
<tr>
<td>Position of body</td>
<td></td>
<td>69</td>
<td>34</td>
<td>16</td>
<td>10</td>
<td>22</td>
</tr>
<tr>
<td>Blood pressure</td>
<td></td>
<td>74</td>
<td>28</td>
<td>14</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Pulse</td>
<td></td>
<td>91</td>
<td>50</td>
<td>15</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Pupil size</td>
<td></td>
<td>114</td>
<td>50</td>
<td>15</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Temperature</td>
<td></td>
<td>64</td>
<td>35</td>
<td>15</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Gastrointestinal sound</td>
<td></td>
<td>47</td>
<td>28</td>
<td>12</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Oropharyngeal sound</td>
<td></td>
<td>78</td>
<td>38</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Bronchial lobe</td>
<td></td>
<td>93</td>
<td>50</td>
<td>15</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Oropharynx</td>
<td></td>
<td>93</td>
<td>50</td>
<td>15</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Eyes</td>
<td></td>
<td>62</td>
<td>28</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Membrane</td>
<td></td>
<td>62</td>
<td>28</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Skin</td>
<td></td>
<td>62</td>
<td>28</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>External auditory canals</td>
<td></td>
<td>62</td>
<td>28</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Internal auditory canals</td>
<td></td>
<td>62</td>
<td>28</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Middle ear</td>
<td></td>
<td>62</td>
<td>28</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>External ear</td>
<td></td>
<td>62</td>
<td>28</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Ossicles</td>
<td></td>
<td>62</td>
<td>28</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Intracranial region</td>
<td></td>
<td>62</td>
<td>28</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Skull</td>
<td></td>
<td>62</td>
<td>28</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Motor activity</td>
<td></td>
<td>62</td>
<td>28</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Coordination</td>
<td></td>
<td>62</td>
<td>28</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Speech</td>
<td></td>
<td>62</td>
<td>28</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Gross motor</td>
<td></td>
<td>62</td>
<td>28</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Fine motor</td>
<td></td>
<td>62</td>
<td>28</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Communication</td>
<td></td>
<td>62</td>
<td>28</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Overall</td>
<td></td>
<td>62</td>
<td>28</td>
<td>12</td>
<td>12</td>
<td>6</td>
</tr>
</tbody>
</table>
**TABLE S 7**

Comparison of the percentage actual care received per modality per category of personnel (extent of care)

<table>
<thead>
<tr>
<th>Modality of care</th>
<th>Researcher</th>
<th></th>
<th></th>
<th>Observer</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RN</td>
<td>ST</td>
<td>N</td>
<td>Comb</td>
<td>Multi</td>
<td>RN</td>
</tr>
<tr>
<td>Patient assessment</td>
<td>64</td>
<td>65</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>65</td>
</tr>
<tr>
<td>Neurological observations</td>
<td>65</td>
<td>71</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>65</td>
</tr>
<tr>
<td>Level of consciousness</td>
<td>59</td>
<td>71</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>56</td>
</tr>
<tr>
<td>Pupils</td>
<td>78</td>
<td>74</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>76</td>
</tr>
<tr>
<td>Limbs</td>
<td>41</td>
<td>59</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>40</td>
</tr>
<tr>
<td>Cerebrospinal fluid leak</td>
<td>44</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>44</td>
</tr>
<tr>
<td>Vital signs</td>
<td>64</td>
<td>82</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>65</td>
</tr>
<tr>
<td>Blood pressure</td>
<td>75</td>
<td>66</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>75</td>
</tr>
<tr>
<td>Pulse</td>
<td>69</td>
<td>69</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>69</td>
</tr>
<tr>
<td>Respiration</td>
<td>67</td>
<td>66</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>69</td>
</tr>
<tr>
<td>Temperature</td>
<td>41</td>
<td>46</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>46</td>
</tr>
<tr>
<td>Patient care</td>
<td>52</td>
<td>60</td>
<td>63</td>
<td>-</td>
<td>-</td>
<td>54</td>
</tr>
<tr>
<td>Eye care</td>
<td>48</td>
<td>46</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>42</td>
</tr>
<tr>
<td>Oropharyngeal care</td>
<td>43</td>
<td>37</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>47</td>
</tr>
<tr>
<td>Bronchial toilet</td>
<td>69</td>
<td>69</td>
<td>70</td>
<td>-</td>
<td>-</td>
<td>68</td>
</tr>
<tr>
<td>Urogenital care</td>
<td>55</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>69</td>
</tr>
<tr>
<td>Change of position</td>
<td>59</td>
<td>60</td>
<td>57</td>
<td>-</td>
<td>-</td>
<td>61</td>
</tr>
<tr>
<td>Patient Independence</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>47</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Communication I</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>65</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Communication II</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>53</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Mobility</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>53</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Exercise therapy</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>24</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Motivation and stimulation:</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Overall</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>37</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>General</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>67</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Activity</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>26</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Radio</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Promotion of independence</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>70</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
**TABLE S 8**

Comparison of the overall percentage of actual care received per modality per category of personnel (norm of care)

<table>
<thead>
<tr>
<th>Modality of care</th>
<th>Researcher</th>
<th>Observer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RN</td>
<td>STN</td>
</tr>
<tr>
<td>Patient assessment</td>
<td>40</td>
<td>44</td>
</tr>
<tr>
<td>Neurological observations</td>
<td>49</td>
<td>47</td>
</tr>
<tr>
<td>Level of consciousness</td>
<td>35</td>
<td>41</td>
</tr>
<tr>
<td>Pupils</td>
<td>62</td>
<td>58</td>
</tr>
<tr>
<td>Limbs</td>
<td>23</td>
<td>22</td>
</tr>
<tr>
<td>Oesophageal fluid leak</td>
<td>24</td>
<td>-</td>
</tr>
<tr>
<td>Vital signs:</td>
<td>48</td>
<td>42</td>
</tr>
<tr>
<td>Blood pressure</td>
<td>51</td>
<td>55</td>
</tr>
<tr>
<td>Pulse</td>
<td>44</td>
<td>32</td>
</tr>
<tr>
<td>Respiration</td>
<td>47</td>
<td>30</td>
</tr>
<tr>
<td>Temperature</td>
<td>46</td>
<td>47</td>
</tr>
<tr>
<td>Patient care</td>
<td>31</td>
<td>26</td>
</tr>
<tr>
<td>Eye care</td>
<td>23</td>
<td>28</td>
</tr>
<tr>
<td>Oropharyngeal care</td>
<td>36</td>
<td>14</td>
</tr>
<tr>
<td>Bronchial toilet</td>
<td>44</td>
<td>29</td>
</tr>
<tr>
<td>Urogenital care</td>
<td>33</td>
<td>-</td>
</tr>
<tr>
<td>Change of position</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td>Patient Independence</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Communication I</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Communication II</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Mobility</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Exercise therapy</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Motivation and stimulation</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Overall</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>General</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Activity</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Radio</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Promotion of Independence</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

*Note:* The table values are percentages.
<table>
<thead>
<tr>
<th>Modality of care</th>
<th>Researcher</th>
<th></th>
<th></th>
<th>Observer</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RN</td>
<td>STN</td>
<td>Comb</td>
<td>Mull</td>
<td>RN</td>
<td>STN</td>
</tr>
<tr>
<td>Patient assessment</td>
<td>66</td>
<td>49</td>
<td></td>
<td></td>
<td>55</td>
<td>49</td>
</tr>
<tr>
<td>Neurological observations</td>
<td>53</td>
<td>61</td>
<td></td>
<td></td>
<td>63</td>
<td>53</td>
</tr>
<tr>
<td>Level of consciousness</td>
<td>25</td>
<td>33</td>
<td></td>
<td></td>
<td>19</td>
<td>34</td>
</tr>
<tr>
<td>Pupil</td>
<td>70</td>
<td>69</td>
<td></td>
<td></td>
<td>72</td>
<td>68</td>
</tr>
<tr>
<td>Limb</td>
<td>24</td>
<td>27</td>
<td></td>
<td></td>
<td>30</td>
<td>34</td>
</tr>
<tr>
<td>Cerebrospinal fluid leak</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
<td>39</td>
<td></td>
</tr>
<tr>
<td>Vital signs</td>
<td>57</td>
<td>48</td>
<td></td>
<td></td>
<td>56</td>
<td>48</td>
</tr>
<tr>
<td>Blood pressure</td>
<td>60</td>
<td>60</td>
<td></td>
<td></td>
<td>67</td>
<td>60</td>
</tr>
<tr>
<td>Pulse</td>
<td>61</td>
<td>61</td>
<td></td>
<td></td>
<td>67</td>
<td>60</td>
</tr>
<tr>
<td>Respiration</td>
<td>58</td>
<td>58</td>
<td></td>
<td></td>
<td>62</td>
<td>59</td>
</tr>
<tr>
<td>Temperature</td>
<td>47</td>
<td>47</td>
<td></td>
<td></td>
<td>63</td>
<td>54</td>
</tr>
<tr>
<td>Patient care</td>
<td>32</td>
<td>29</td>
<td>46</td>
<td></td>
<td>35</td>
<td>30</td>
</tr>
<tr>
<td>Eye care</td>
<td>20</td>
<td>30</td>
<td></td>
<td></td>
<td>23</td>
<td>47</td>
</tr>
<tr>
<td>Oropharyngeal care</td>
<td>20</td>
<td>14</td>
<td></td>
<td></td>
<td>30</td>
<td>25</td>
</tr>
<tr>
<td>Bronchial toilet</td>
<td>43</td>
<td>29</td>
<td>50</td>
<td></td>
<td>63</td>
<td>28</td>
</tr>
<tr>
<td>Urogenital care</td>
<td>33</td>
<td></td>
<td></td>
<td></td>
<td>43</td>
<td></td>
</tr>
<tr>
<td>Change of position</td>
<td>37</td>
<td>36</td>
<td>42</td>
<td></td>
<td>40</td>
<td>33</td>
</tr>
<tr>
<td>Patient independence</td>
<td></td>
<td></td>
<td></td>
<td>23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication I</td>
<td></td>
<td></td>
<td></td>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication II</td>
<td></td>
<td></td>
<td></td>
<td>19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mobility</td>
<td></td>
<td></td>
<td></td>
<td>33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Endo therapy</td>
<td></td>
<td></td>
<td></td>
<td>11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motivation and stimulation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General</td>
<td></td>
<td></td>
<td></td>
<td>19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activity</td>
<td></td>
<td></td>
<td></td>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rest</td>
<td></td>
<td></td>
<td></td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Promotion of independence</td>
<td></td>
<td></td>
<td></td>
<td>20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PROTOCOL OF MANAGEMENT OF HEAD INJURED PATIENT AT THE SITE OF THE INCIDENT

1. CHECK FOR RESPONSIVENESS.

2. ASSESS BREATHING ABILITY AND PATENCY OF AIRWAY,
   2.1 If conscious: administer 100 percent oxygen (10L/min.) via reservoir mask.
   Unconscious: administer 100 percent oxygen (24L/min.) via bag mask/oral airway.

2.2 Maintain airway.

3. ESTABLISH CIRCULATION.
   3.1 Commence intravenous therapy using dextrose saline.
   3.2 Control obvious bleeding.

   In patients who reach hospital it is common to find systemic dysfunction, namely, hypoxemia, hypotension and anaemia that can threaten the brain.

4. ASSESS PATIENT:
   4.1 Mechanism of injury.
   4.2 History.
   4.3 Alcohol and drugs.

5. SEARCH FOR OTHER INJURIES.

6. CONDUCT A NEUROLOGICAL EXAMINATION:
   6.1 Perform and record neurological observations, using Glasgow Coma Scale, every 15 minutes
   6.2 Note motor and sensory function.

7. MONITOR AND RECORD VITAL SIGNS EVERY 15 MINUTES:
   7.1 Blood pressure.
   7.2 Pulse.
   7.3 Respiration.

8. TREAT OPEN HEAD INJURIES.

9. PREVENT ASPIRATION PNEUMONIA.

10. IMMOBILISE THE PATIENT BEFORE TRANSPORT.

   All patients with a head injury must be treated as a cervical spinal injury until proved otherwise.

11. APPROPRIATE EMERGENCY SERVICES MUST BE AVAILABLE AT THE SITE OF THE ACCIDENT.
TRANSPORT PROTOCOL

The debate concerning the staffing and resources available for transporting the head injured victim continues. Ambulances and helicopters are both in use.

The following guidelines must be adhered to if permanent neurological damage is to be avoided when transporting or transferring patients with head injuries.

1. **RAPID TRANSPORT TO THE APPROPRIATE MEDICAL CENTRE IS ESSENTIAL.**

   The transferring of selected rather than all head injury patients to neurosurgical units is safe practice only if policies regarding treatment are accorded with primary surgeons and patients who need to be transferred can be transferred without delay. A neurosurgical service with fully trained personnel should fetch the patient from the transferring hospital to assist in initial management and to supervise the staff.

2. **CONTACT THE MEDICAL CENTRE TO NOTIFY THE NEUROSURGEON OF THE PENDING ADMISSION.**

3. **A REGISTERED NURSE OR PHYSICIAN SHOULD ACCOMPANY THE UNCONSCIOUS HEAD INJURED VICTIM DURING ALL TRANSPORTATION, INCLUDING TO THE RADIOLOGY DEPARTMENT.**

4. **WHEN POSSIBLE, BEFORE THE PATIENT LEAVES THE ACCIDENT OR EMERGENCY DEPARTMENT, THE PATIENT SHOULD HAVE BEEN SEEN BY A PRIMARY PHYSICIAN, PREFERABLY A NEUROSURGEON.**

5. **MAINTAIN CONTINUOUS PATENCY OF THE AIRWAY.**

   5.1 A route for bag ventilation must be established.
   5.2 Suction apparatus must be available during transfer/transport.
   5.3 The patient, when being transported, must be in the lateral position to prevent asphyxiation.

6. **IMMOBILISE THE PATIENT'S NECK IN A NEUTRAL POSITION IF A SPINAL INJURY HAS NOT BEEN EXCLUDED.**

7. **ESTABLISH A ROUTE FOR FLUID RESUSCITATION PRIOR TO TRANSFER.**

8. **INSERT A URINARY CATHETER IN ALL UNCONSCIOUS PATIENTS PRIOR TO TRANSFER.**

9. **COMPLETE DATA MUST BE AVAILABLE.**
PROTOCOL OF MANAGEMENT IN THE ACCIDENT AND EMERGENCY DEPARTMENT

Resuscitation and stabilisation of the patient is always more important than the specific treatment of the head injury.

1. ATTENTION TO FUNDAMENTALS OF RESUSCITATION.

1.1 ESTABLISH RESPIRATORY FUNCTION.

1.1.1 MAINTAIN A CLEAR AIRWAY.

The method used depends on the patient's level of consciousness:

a. Remove dentures.

b. Correct positioning of the patient:
   Place in the prone or semi-prone position from the outset. If the airway is threatened there should be no hesitation in making the head dependent.

c. Nasopharyngeal suction may be employed.

d. The use of an oral airway:
   Once the patient regains consciousness, the oral airway must be removed immediately.

e. The use of an endotracheal tube:
   Cuffed 10mm. endotracheal tube: Adult male.
   Cuffed 9mm. endotracheal tube: Female.
   A nasotracheal tube may be used in the case of a cervical spinal injury or fractured base of skull.

f. Tracheostomy:
   Emergency tracheostomy is performed if there are extensive facial injuries, otherwise it is an elective procedure.

1.1.2 ENSURE ADEQUATE VENTILATION.

The correction of systemic hypoxia takes precedence over minor effects on intracranial pressure.

a. Monitor respiratory rate, rhythm and volume at frequent intervals.

b. Maintain respiratory rate between 10-15 breaths per minute.

c. The tidal volume should be 10-15 ml/kg body weight.

d. The FIO₂ should be <50 percent.

e. The method of ventilation used depends on the condition of the patient:
   (i) Continuous mandatory ventilation (CMV).
   (ii) Intermittent mandatory ventilation (IMV).
   (iii) IMV + positive end expiratory pressure (PEEP).
   The PEEP should be <10cm H₂O. The effect of PEEP is negated if the head of the bed is raised to 30 degrees.
   (iv) IMV + PEEP + continuous positive airways pressure (CPAP).
   (v) CPAP.

f. Provide respiratory therapy.

g. Avoid coughing, straining and fighting against the ventilator by using long acting neuromuscular agents.
1.1.3 ENSURE ADEQUATE OXYGENATION.

a. Administration of oxygen.
   (i) Administer 100 percent oxygen until arterial blood gas analysis is performed and for the first 24 hours. Thereafter the inspired oxygen must be higher than that required to maintain a normal $P_O_2$. If the $P_O_2 < 80$ mm. Hg and $P_CO_2 > 35$ mm. Hg supplement oxygen.
   (ii) Humidify the oxygen supply adequately.

b. Perform blood gas analysis and chest X-ray.
   (i) Maintain $P_O_2$ above 70-80 mm. Hg.
   (ii) Maintain $P_CO_2$ between 25-30 mm. Hg.
   (iii) Take blood gases if there is a deteriorating level of consciousness, raised intracranial pressure or a change in baseline observations or vital signs.

1.1.4 BRONCHIAL TOILET.

a. The patient must be pre-oxygenated with 100 percent oxygen for five minutes preceding the procedure.

b. The patient must be suctioned briefly and intermittently.

c. Each suctioning event to last < 10-15 seconds.

de. The procedure must be carried out under strict sterile conditions.

f. Use a suction catheter with side suction holes to prevent damage to the mucosa.

1.1.5 PREVENT GASTRIC ASPIRATION.

a. A nasogastric tube may be passed to empty the stomach in patients who are likely to vomit.
b. The nasogastric tube should be passed after intubation for fear of vomiting and aspiration.
c. The insertion, by a physician and not a nurse, of a nasogastric tube in a patient with a suspected fractured base of skull must be undertaken with care.

1.2 ESTABLISH ADEQUATE CIRCULATION AND CARDIAC FUNCTION.

1.2.1 MAINTAIN HYDRATION.

- Tyson, et al. (1978) recommend the commencement of intravenous therapy at the site of the accident. According to Jennett (1983), most head injuries recover within the first 24 hours and are able to take oral fluids. Therefore to establish an intravenous route as a routine in the early stages is unnecessary and possibly harmful. Intravenous fluids must not be given unless the patient is shocked. A degree of dehydration will decrease the risk of cerebral oedema.

1.2.2 TREAT SHOCK.

a. Monitor vital signs quarterly:
   - Blood pressure, pulse, respiration, temperature (2h).
   - Establish an intravenous line.
   - Commence fluid therapy using dextrose/saline.
   - Measure and chart fluid intake and output hourly.
   - Insert a urinary catheter to record output accurately and prevent bladder distension.

1.2.3 CONTROL BLEEDING.

a. Examine and assess the patient for signs of extracranial injury.
b. Control any bleeding from scalp lacerations.
2. ASSESS STATUS OF PATIENT.

Once basic life and brain support have been initiated and instituted a complete, comprehensive assessment of the patient's status is imperative. The assessment of the head injured patient should include the following:

2.1 GENERAL ASSESSMENT.

A thorough examination of the patient must be completed in the accident and emergency department and throughout the patient's stay in hospital. The extent and nature of the examination will depend on the patient's condition and the purpose for undertaking the examination at that point in time.

2.1.1 PATIENT HISTORY.

This may be obtained from the patient, significant others or ambulance attendants:

a. Previous medical, surgical, psychosocial, drug, personal practice, economic and educational history.

b. Present history.

2.1.2 SYSTEMATIC EXAMINATION OF ALL BODY SYSTEMS.

2.1.3 ASSESS FOR PRESENCE OF EXTRACRANIAL INJURIES.

2.2 NEUROLOGICAL ASSESSMENT.

2.2.1 OBTAIN AN ACCURATE HISTORY.

a. Previous central nervous system disorders.

b. Current central nervous system disorders.

c. Drug history.

d. History of accident.

(i) The mechanism of injury.

(ii) The post traumatic clinical course.

2.2.2 COMPLETE A FULL NEUROLOGICAL EXAMINATION.

a. Assess:

(i) The level of consciousness using the Glasgow Coma Scale.

(ii) Signs and symptoms of altered intracranial pressure.

(iii) Motor and sensory function.

(iv) Cranial nerve function.

(v) The extent of the primary brain damage.

(vi) Secondary effects of the brain injury.

(vii) Its pattern or evolution.

(viii) The occurrence of complications.

b. Look for external signs of cranial trauma:

(i) Scalp wounds.

(ii) Fractured base of skull.

(iii) Cerebrospinal fluid leak.

(iv) Battle's sign.

c. Assess cognitive functioning:

(i) Memory.

(ii) The presence or absence of amnesia.
d. Perform and document base line observations every 15 minutes:
   - Level of consciousness;
   - Pupil-size, shape, reaction to light;
   - Eye movement;
   - Restlessness;
   - Headache;
   - Nausea and vomiting;
   - Visual disturbances;
   - Seizure activity;
   - Vital signs.

The consumption of alcohol by the head injured victim must not influence the assessment or management of the patient.

2.3 DIAGNOSTIC TESTS THAT MAY BE REQUIRED.

2.3.1 RADIOGRAPHIC STUDIES.

If the results of a particular X-ray will not change the emergency department management, then the X-ray should be deferred.

a. X-ray of cervical spine.
   Obtain lateral cervical spine X-ray first in an unconscious head injured patient.

b. Chest X-rays.
   It is this study rather than the skull X-rays that usually reveals the potential source of secondary insults to the brain.

c. Skull X-rays.
   Obtain lateral and anterior-posterior views. Important management decisions depend on the presence or absence of skull fractures. Therefore, for the safety of the patient, doctors in accident and emergency departments must be able to read skull X-rays.

d. Computerised scan (CT scan).
   CT scanning has simplified the management of head injury patients and is a non-invasive technique that can detect haemorrhage, haematoma, cerebral oedema, midline shift, hydrocephalus and bony displacement. Patients who present with a deteriorating level of consciousness or a focal deficit should have a CT scan. The computerised scan can be used sequentially to check the progress and response to treatment of the patient who fails to improve or shows deterioration.
2.3.2 BLOOD SAMPLE ANALYSIS.

**TABLE A1**

Normal blood sample values

<table>
<thead>
<tr>
<th>Blood gases</th>
<th>Full blood count</th>
<th>Electrolytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>PH 7.36 - 7.44</td>
<td>Haemoglobin</td>
<td>Sodium 135 - 145 mEq/L</td>
</tr>
<tr>
<td>PO₂ 75 - 100mmHg</td>
<td>Male: 13.5 - 18 g/dL</td>
<td>Potassium 3.5 - 5.5 mEq/L</td>
</tr>
<tr>
<td>PCO₂ 35 - 45mmHg</td>
<td>Female: 12 - 16 g/dL</td>
<td>Chloride 96 - 105 mEq/L</td>
</tr>
<tr>
<td>S.B 20 mEq/L</td>
<td>Red cell count:</td>
<td></td>
</tr>
<tr>
<td>B.E +1 - -1</td>
<td>Male: 4.5 - 6.0 million/mm³</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Female: 4.0 - 5.0 million/mm³</td>
<td></td>
</tr>
<tr>
<td></td>
<td>White cell count:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Male: 5 - 10,000/mm³³</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Female: 6 - 10,000/mm³³</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Blood glucose</td>
<td>Haematocrit</td>
</tr>
<tr>
<td></td>
<td>70 - 120mg/dL</td>
<td>Male: 40 - 54 percent</td>
</tr>
<tr>
<td></td>
<td>Female: 38 - 47 percent</td>
<td></td>
</tr>
</tbody>
</table>

2.3.3 URINE ANALYSIS.

a. Lactate analysis.
b. Urine osmolality.

3. MAINTAIN INTRACRANIAL PRESSURE AND CEREBRAL PERFUSION WITHIN NORMAL LIMITS.

The following may be employed:

3.1 Adequate resuscitation.
3.2 Appropriate assessment of patient status.
3.3 Decrease noxious stimulation.
3.4 Correct poor perfusion of patient.
3.5 Choice of therapeutic agents:
   3.5.1 Depressants.
   3.5.2 Mannitol.
   3.5.3 Furosemide.
   3.5.4 Barbiturate therapy.
3.6 Mechanical ventilation.
3.7 Commence intracranial pressure monitoring.

4. TREAT OPEN INJURIES.

Accurate assessment of open injuries is essential.

4.1 Scalp lacerations may require suturing or debridement.
4.2 Administer tetanus prophylaxis to head injury victims with soft tissue injury.

5. TREAT ASSOCIATED INJURIES ACCORDINGLY.
PROTOCOL OF MANAGEMENT OF THE PATIENT DURING THE ACUTE PHASE

INSTITUTE MULTIDISCIPLINARY THERAPEUTIC PROGRAMME THAT INCLUDES THE FOLLOWING PRINCIPLES:

1. MAINTAIN A CLEAR AIRWAY.
2. MAINTAIN HAEMODYNAMIC HOMEOSTASIS.
3. MAINTAIN INTRACRANIAL PRESSURE WITHIN NORMAL LIMITS.
4. PREVENT SECONDARY EFFECTS OF THE BRAIN INJURY.
5. PREVENT AND DETECT POTENTIAL AND EXISTING COMPLICATIONS EARLY.
6. ASSESS AND OBSERVE THE HEAD INJURED PATIENT ACCURATELY.
7. MAINTAIN FLUID, ELECTROLYTE BALANCE, NUTRITION AND ELIMINATION.
8. MOBILISE THE PATIENT.
9. INSTITUTE PREVENTIVE REHABILITATION. INCLUDE REALITY ORIENTATION.
10. COMMENCE DISCHARGE PLANNING.

MODALITIES OF TREATMENT THAT MAY BE INITIATED IN THE ACCIDENT AND EMERGENCY DEPARTMENT AND CONTINUED ELSEWHERE.

1. POSITION OF PATIENT.
2. CONTROLLED VENTILATION.
3. INTRACRANIAL PRESSURE MONITORING.
4. STEROIDS.
5. DIURETIC THERAPY.
6. BARBITURATE THERAPY.
7. USE OF ANALGESICS.
8. USE OF ANTI-CONVULSANTS.
9. ANTIMICROBIAL THERAPY.
10. CONTROL OF BODY TEMPERATURE.
APPENDIX U

JOB DESCRIPTION
OF
NURSING PERSONNEL
The role of the practitioner teacher enables the nurse to actualize the professional role of service, education, consultation and research. Christman (1979a: 11) states that "The astute use of expert power is a chief means of influencing the care structure."

The practitioner teacher is a nursing faculty member who makes a positive contribution to nursing practice through involvement in the clinical situation, but does not take over from the nurse-in-charge of the unit. The role of the practitioner teacher must be clearly defined and is one of:

(i) A free agent in the staff hierarchy who is able to interact with all categories of nursing personnel as the need arises.
(ii) Consultant regarding nursing practice and patient care problems.
(iii) Maintaining nursing excellence.
(iv) Organizer of educational programmes.
(v) Preceptor for nursing students.
(vi) Primary nurse.
(vii) Researcher.
(viii) Role model negating the dichotomy of service and education who promotes the correlation of theory and practice.
(ix) Serves as a faculty member and member of the Quality Assurance Committee.
APPENDIX U 2

THE PRIMARY NURSE

The primary nurse (Engstrand, 1977) is accountable for the patient's nursing care continuously on a 24 hour basis. Using the framework of the nursing process the primary nurse assesses the patient, plans and implements the patient's care and evaluates the outcome. The concept of the primary nurse combines direct and indirect patient care, clinical expertise, experience and a broad base of knowledge in order to provide high quality patient care (Evanston Hospital Corporation, 1979).

The primary nurse supervises a particular team of staff members to whom responsibility for care is delegated. The team may consist of a primary nurse, other registered nurses known as associate nurses, student nurses and auxiliary personnel (Engstrand, 1977). The team members are answerable to the primary nurse for providing the nursing care prescribed. Depending on the clinical situation two to six patients may be allocated to one primary nurse (Engstrand, 1977). The registered nurse establishes a loose primary relationship with the patient from the time of admission until discharge from the unit or the hospital.

Primary nursing allows the clinically competent nurse to direct and provide nursing care. Depending on their level of competence the charge nurse, clinical nurse specialist, practitioner teacher and registered nurses may all act as primary nurses (Engstrand, 1977; Christman; 1979a).
THE CLINICAL NURSE SPECIALIST

A clinical nurse specialist is a nurse practitioner who has developed a high level of clinical expertise and knowledge in a particular field of practice and has at least graduate level preparation in clinical nursing or a masters degree in clinical nursing practice (Rowland & Rowland, 1980: 364).

The clinical nurse specialist is responsible to the nursing officer supervising the area and not the charge nurse and is a free agent within the hierarchy. The introduction of the clinical nurse specialist must be viewed as an expansion and contributory role within the scope of nursing practice (Murphy & Schmitz, 1979). The role of the clinical nurse specialist must be defined and negotiated to include a commitment to excellence of nursing practice, the patient, education, research and to improving clinical competence and includes:

(i) Concern regarding the quality of care rendered to patients:
- Prepares protocols of management and nursing manuals,
- Establishes quality assurance programmes,
- Helps establish policies for patient care,
- Assesses patient needs and assists staff to plan nursing intervention.

In the event that staff are not competent to deliver care the clinical nurse specialist will give direct care.

(ii) Patient care:
- Primary nursing,
- Co-ordinates services,
- Discharge planning,
- Patient teaching,
- Arranges referrals.

(iii) Consultant:
- Involved in institutional and policy planning representing the nursing perspectives of the patient,
- Consults throughout the hospital regarding the specialty.

(iv) Responsible for:
- Planning and implementing intervention within the policy of the institution in order to meet the needs of the staff and patients,
- Bringing new knowledge to bear on nursing practice,
- Developing strategies and technologies that are transferred into practice.
(v) Staff development:
- Organises educational programmes according to staff needs.
- Professional development of staff.
- Counsels and guides staff.

(vi) Research.

(vii) Supervises and undertakes clinical research to benefit nursing practice.

(viii) Evaluation:
- Participates in and organises quality assurance programmes.
- Assesses staff progress.
- Assesses patient outcomes.

The rehabilitation liaison nurse is the link between the patient, the family, the community and the health professionals (Edmonds-Hill, 1977; Simonson, 1977; Ozga, 1978). The introduction of the rehabilitation liaison nurse will:
(i) Maintain continuity of care.
(ii) Encourage participation in patient and family education.
(iii) Ensure effective communication between staff and patient.
(iv) Ensure effective referral system to health professionals and community services.
(v) Ensure correct assessment and settlement of the patient in the home environment or other institution.
SPECIALIST NURSING COURSES
THE TWELVE MONTH POST-REGISTRATION NEUROMEDICAL AND NEUROSURGICAL NURSING COURSE

This is to be registered with the S.A.N.C. as an additional qualification and developed by The University attached to The Hospital. The regulations are to be set out by the S.A.N.C. and The University in a similar fashion to those for other post-registration diplomas.

Objectives of the course must include:

- To provide the nurse with the learning opportunity to upgrade, develop and extend basic knowledge.
- To provide the nurse with comprehensive knowledge of the nervous system and its disorders.
- To utilize the scientific method in nursing to promote excellence.
- To improve the quality of neurosurgical care through scientific knowledge and clinical expertise.
- To foster quality assurance programmes for neurosurgical nursing.
- To establish the role of the nurse in neurosurgical care.
- To improve communication, support and counselling skills.
- To teach the nurse about patient rehabilitation techniques from day one of the patient's admission.
- For the purpose of staff development, teaching and research.

The curriculum must include:

- Neuroanatomy.
- Neuropathology.
- Neuropathology.
- Neuropharmacology.
- Neuroradiology.
- Disorders of the nervous system including head injuries.
- Preventive, promotive, curative and rehabilitative aspects of health care.
APPENDIX V 2

THE SIX MONTH NEUROMEDICAL AND NEUROSURGICAL
NURSING COURSE

This course is aimed at registered nurses working in neuromedical/neurosurgical units.

Objectives of the course must include:

- To provide the nurse with the learning opportunities to upgrade basic knowledge.
- To allow the nurse to utilize the scientific method in nursing.
- To improve the quality of neurosurgical care through education and clinical experience.
- To establish the role of the neurosurgical nurse.
- To foster the development of quality assurance programmes for neurosurgical nursing.
- To allow for professional development, research and teaching in the unit.

The curriculum of the course must include:

- Neuroanatomy.
- Neurophysiology.
- Neuropharmacology.
- Neuroradiology.
- Disorders of the nervous system.
- Preventive, promotive, curative and rehabilitative aspects of health care.
THE SIX MONTH COURSE IN REHABILITATION NURSING

This course is aimed at those registered nurses who will be working in the rehabilitation setting.

Objectives of the course must include:

- To define the concept of rehabilitation.
- To allow the nurse to utilize the scientific method in nursing in the sphere of rehabilitation.
- To establish the role of the nurse in rehabilitation.
- To teach the nurse rehabilitation techniques.
- To provide the nurse with the theoretical knowledge and clinical expertise to enable her to establish a quality assurance rehabilitation programme.
- To improve the quality of rehabilitative care.
- To improve the level of knowledge of the nurse to teach fundamentals of rehabilitation.
- To allow for professional development and research.
- To familiarise the nurse with community services and voluntary organisations.
REFERENCES

ABEILSON, N.M.

ALLEN, S.R. and MOSCHAK, V.

ALLISON, S. and KINLOCH, K.

AMBROSE, J. et al.

AMERICAN NURSES' ASSOCIATION. (1973).
*Standards of Nursing Practice.*
American Nurses' Association.

*Standards of Medical-Surgical Nursing Practice.*
American Nurses' Association.

AMERICAN NURSES' ASSOCIATION. (1975a).
*A Plan for the Implementation of the Standards of Nursing Practice.*
American Nurses' Association.

AMERICAN NURSES' ASSOCIATION. (1975b).
*Guidelines for Review of Nursing Care at the Local Level.*
American Nurses' Association.

AMERICAN NURSES' ASSOCIATION. (1976).
*Quality Assurance Workbook.*
American Nurses' Association.

AMERICAN NURSES' ASSOCIATION. (1977a).
*Standards of Neurological and Neurosurgical Nursing Practice.*
American Nurses' Association.

AMERICAN NURSES' ASSOCIATION. (1977b).
*Standards of Rehabilitation Nursing Practice.*
American Nurses' Association.

AMERICAN NURSES' ASSOCIATION. (1985).
*Code for Nurses with Interceptive Statements.*
American Nurses' Association.

ANDERSON, B.J.
ANDREWS, G.
Quality assurance in health care. World Hospitals, February 1981: 17(1); 18-23.

ANNEGERS, J.F. et al.

ANWAR, M.
Nurses found Floras way home. Nursing Mirror, 23 August 1979: 34-35.

APPLETON, J. and THOMAS, D.

ARNDT, K. et al.


AYDELOTTT, K.M.


BACKSHEIDER, J.

BAILEY, J.


BISDEE, H.C. and HIPKENS, T.P.

BLOCH, D.

BLYTH, B.
BOOM, V.

BOND, M.R.

BOORTZ-MARX, R.

BRACKEN, R.L. and CHRISTMAN, L.
An incentive program designed to develop and reward clinical competence. *Journal of Nursing Administration*, October 1978: 8-18.


BUCKLEY, G.E.


Die verpleegkundige hantering van 'n patient met hoofbeensg. Ondergrondswetlike. *Kurrikulumontwikkeling*. Universiteit van die O.V.S.

CAMPBELL, S.

CAMPBELL, W. and DILLON, A.

CANTOR, M.

CAPLAN, B.

*Nursing Diagnosis, Application to Clinical Practice*. Philadelphia: J.B. Lippincott Company.
CARUSO, M.M. and THOMPSON M.T.

CHILTON, S.

CHRISTMAN, L.


CLARE, B.L.

CLARKE, A.K.

CLELAND, V.
Relating nursing staff quality to patients' needs. The Journal of Nursing Administration, April 1982: 32-36.

CLINTON, J.F. et al.

COLE, J.R. et al.

CONNOLLY, R. and ZEWEB, G.R.

CONWAY-RUTKOWSKI, B.L. (1982).

COPLESTONE, J.A.

CORRIGAN, J.D. et al.

CROS, A.

DAVIS, A.L. and JELLINEK, H.


EAMES, P. and WOOD, R.
Rehabilitation after severe brain injury: a special unit approach. International Rehabilitation Medicine, 1985a. 7(3): 130-133.


EDDY, L. and WESTBROOK, L.

EDITORIAL (1978).

EDMONDS-HILL, P.A.

ELLIOTT, J. and SMITH, D.R.

ENGSTRAND, L.J.

S.A.: Thomson Publications (Pty) Ltd.

EPPERSON-SEBOOR, M.M. and RIFKIN, E.W.

EVERIDGE, P.E. and PACKARD, B.W.


EVANSTON HOSPITAL CORPORATION. (1979).
The Evanston Story. Primary Nursing Comes Alive. U.S.A.: Evanston Hospital Corporation, Division of Nursing.

FANSHAWE, E.

FISCHER, R.P. et al.


HEGYVARY, S.T.  

HEISE, T.  

HENDERSON, V.  

HENDERSON, V.  
(1966).  
The Nature of Nursing: A Definition and its Implications for Practice, Research, and Education.  London: The Macmillan Company: 15.

HILLMAN, K.M.  

HIRSCHBERG, G.G. et al. (1976).  

HOWARD, P.A.  

HUCZYNSKI, A.  

HUMPHREY, M. and ODDY, M.  

JACUS, C.M.  

JAQGER, J. et al.  


JELINEK, H.M. and HARVEY, R.F.  

JELINEK, H.M. et al.  
JENNETT, B.


Epidemiology of head injury. Comment on a report prepared by Dr. J.H. Field for the research division of DHSS. Health Trends. 1976c. 8: 77-78.


Brain damage: Predicting the quality of survival. Nursing Mirror. 1 February 1979: 30-31.


JENNETT, B. and BOND, M.

JENNETT, B. and MacMILLAN, R.

JENNETT, B. et al.

JENNETT, B. et al.

JENNETT, B. et al.

JENNETT, B. et al.

JENNETT, B. et al.

JENNETT, B. and TEASDALE, G.

JENNINGS, S.


JOHANNESBURG HOSPITAL. (n.d. a).

JOHANNESBURG HOSPITAL. (n.d. b).
Role of student nurse on night duty. Johannesburg: Johannesburg Hospital.


JONES, C.


KEEBNER, S.M. and SWEIGART, J.B.

KELLY-HAYES, M.

KLAUBER, M.R. et al.

KRATZ, C.
Getting to grips with the ethical dilemma. *Nursing Times*, 7-13 July 1982. 78(27): 1133-1134.


KRUGER, A.

KUNKEL, J.
LAING, M. and NISH, M.

LAMBERTSEN, E.G.

LANHAM, G.

LAURIE-SHAW, B. and STOVE, V.

LEVIN, H.S. et al. (1983).
Neurobehavioral Consequences of Closed Head Injury. New York: Oxford University Press.

LEWIN, W.


LINDEMAN, C.


LINDSAY, K.W. et al.


LONG, C.J. et al.
LYNCII, W.J. and MAUSS, N.K. 

MACKLEY, B. et al. 


MAHONEY, B.K. 

MAITRA, A.K. 

MARSHALL, L.F. 


MARTIN, P.J. 


MAYERS, M.G. et al. (1977). 

MAYO, P.F. 

McGUIRE, R.L. 

MENDELOW, A.D. et al. 

MILLER, B.A. 
MINISTRY OF HEALTH, LONDON.
National Health Service: Rehabilitation in the hospital service and its relation to other services.

MINOR, H.B. and MACAULEY, A.C.

MINTEER-CONVERRY, M.A.

MOORE, K.R.
What nurses learn from nursing audit. Nursing Outlook, April 1979 : 254-258.

MURPHY, J.P. and SCHMITZ, M.

MYKTYTA, L.J.

Some Legal Aspects of the Nurse's Responsibility in the Occupational Health Field and Elsewhere.
London: MacMillan (Journals) Ltd.

NICHOLS, P.J.R.

Rehabilitation Medicine.

The Critically Ill Neurosurgical Patient.
New York : Churchill Livingstone.

NORBY, R.B. et al.


OREM, D.E. (1960)
Nursing : Concepts of Practice.

OZGA, A.

A Guide for Staffing a Hospital Nursing Service.
PARSONS, L.C. and SHOGAN, J.S.O.  

PARSONS, L.C. and WILSON, M.M.  

PARSONS, L.C. et al.  


PHANEUF, M.C.  


PHANEUF, M.C. and WANDELT, M.A.  

PRIGATANO, G.P. et al.  

_Neuropsychological and Neuropsychiatric Nursing_. London: Balliere Tindall.


PURGATORIO-HOWARD, K.  

QUIGLEY, P.A.  
RAMEY, I.G.

RANSDEN, J.D.

RAPPAPORT, M. et al.
Disability rating scale for severe head trauma: Coma to community. *Archives of Physical Medicine and Rehabilitation*, March 1982. 63(3): 118-123.

REPORT.

RILEY, M. and MOSIS, J.A.

RIMEL, R.W.


RIMEL, R.W. et al. (1978).
Acute Care of the Head and Spinal Cord Injured Patient at the Site of Injury. U.S.A.: Department of Neurosurgery, University of Virginia.

RIMEL, R.W. et al.

RIMEL, R.W. et al.

RIMEL, R.W. et al. (n.d.).
Moderate head injury: Completing the clinical spectrum of brain trauma. U.S.A.: Department of Neurosurgery, University of Virginia.

RIMEL, R.W. and LANGFITT, T.W.

RIMON, D.

ROPER, N. et al. (1980).
The Elements of Nursing.

ROSE, J. et al.
Medical practice process and outcome. Avoidable factors contributing to death after head injury.
British Medical Journal, 3 September 1977 : 615-618.

ROSE, M.

Quality Patient Care and the Role of the Clinical Nursing Specialist.
New York: John Wiley and Sons.

ROWLAND, H.S. and ROWLAND, B.L. (1980).
Nursing Administration Handbook.

Nurses Related to Research in Nursing.
London: Palastynes Organisation Ltd.

RUBIN, C.F. et al.

RUSH-PRESBYTERIAN - ST. LUKE'S MEDICAL CENTER.

SCHMADL, J.C.

4th ed. Cape Town: Juta and Co. Ltd.

An Outline of the Responsibilities of Certain Grades of Nursing Personnel in Hospitals in the
Republic of South Africa.

Nursing Administration Guides. NUA003/3.
Pretoria: UNISA publications.

— (1986).

The dependent, independent and interdependent functions of the nurse practitioner - a legal and

— (1986).
Durban: Butterworths.

SELVAGGI, L.M. et al.

SERIES, C. and LINCOLN, N.

SHERRY, D.

SIMMON, M.J.

SMELTZER, C.H. et al.

Neuroligic Problems - A Critical Care Nursing Focus.
Maryland: Robert J. Brady Company.

SOUTH AFRICAN NURSING ASSOCIATION (n.d.).
Student Status - The Board's View Regarding Superannuation Status of Student Nurses.

Pretoria : S.A.N.A.

STEADMAN, J.H. and GRAHAM, J.G.

STEVENSON, B.

STOREY, P.
Psychological effects of brain damage. Occupational Therapy, January 1976: 3-5.

Legal Handbook for Nurses and Health Personnel.

STUDEBAKER, B.L. and DYKSTRA, J.W.
Nursing care plan for the head injured patient treated with barbiturates. Critical Care Nurse, May/June 1984: 77-80.

SULTAN, S.

Glasgow: Royal College of Physicians and Surgeons.

TEASDALE, G. and GALBRAITH, S. 

TEASDALE, G. and JENNETT, B. 

Research Cochrane Directory. 

TRESCING, R. et al. 

TOBIS, J.S. et al. 

TOTIEN, J. and BUXTON, R. 

TRANSVAAL DEPARTMENT OF HOSPITAL SERVICES. 

TRANSVAALSDE DEPARTEMENT VAN HOSPITAAALDIENSTE. 

Elements of Research in Nursing. 

TRETHOWAN, W.H. 

TROCKMAN, G. 

TRUNKAN, D.D. 

Patient Care Standards. 
TUMIN, W. 

Acute Care of the Head and Spinal Cord Injured Patient in the Emergency Department. 
U.S.A.: Department of Neurosurgery, University of Virginia.


The Johannesburg Hospital. 

VANHEGAN, I.A.D. 

VERNEBERG, K. et al.

Handbook of Clinical Neurology. 

Manual of Basic Nursing. 
5th ed. Cape Town: Juta & Co. Ltd.

WAINRIGHIT, P. and BURNIP, S. 

WALTON, M.H. 

Quality Patient Care Scale. 

WANDELT, M.A. and PHANEUF, M.G. 

Short Nursing Competencies Rating Scales. 

WATSON, A. and MAYERS, M. 

WEBSTER, M. 
WEINSTEIN, E.L.,

WEISS, G.H. et al.,

WENTWORTH HOSPITAL. (1983),
Department of Neurosurgery - Standing Instructions. Durban : Wentworth Hospital.

WBSTON, P.A.M,

WHO,

WICTORSON, K.E. and CIERMARK, M.

WILLIAMSON-KIRKLAND, T.E. and BERNI, R.

WISEMAN, J.


A nursing audit of basic care - 2. Further developments and a critical evaluation. Nursing Times. 3 November 1977b. 73(44) : 141-143.

WOODY, M.F.
Where is nursing in quality assurance. Source unknown : 33-38.

WULF, T.

YOUNG, J.A.

CONSULTATIONS


GREEN, H. (1933/4) Head, Accident and Emergency Services, Johannesburg Hospital, Johannesburg, South Africa.

JINDRICH, L.J. Managing Director, Procad Systems, Johannesburg, South Africa.

LEE, D. Senior lecturer, Department of Nursing Education, University of The Witwatersrand, Johannesburg, South Africa.

LIPSCHITZ, R. Professor and Head, Department of Neurosurgery, University of the Witwatersrand, Johannesburg Hospital and Associated Hospitals, Johannesburg, South Africa.

MEYERS, D. The Department of Statistics, The University of The Witwatersrand, Johannesburg, South Africa.

REINACH, G. The Institute for Medical Biostatistics, The South African Medical Research Council, Medical School, Johannesburg, South Africa.

SCHREIBER, L.A. (1985/6) Chief Nursing Service Manager, Johannesburg Hospital, Johannesburg, South Africa.

WILLIAMSON, S.B. Professor Emeritus, Department of Nursing Education, University of The Witwatersrand, Johannesburg, South Africa.
BIBLIOGRAPHY

Better Patient Care through Nursing Research.

ABELSON, N.M. (1980).
Treatment of raised intracranial pressure.
Johannesburg Hospital: Nursing Department Bulletin. 8 (31).

ALLAN, D.

APPLETON, J. and THOMAS, D.

ARADINE, C.R.

ASHTON, K.

An Introduction to Head Injuries.
Calcutta : Oxford University Press.

BAILEY, J.

BARHAM, V.Z. and SCHNEIDER, W.R.

BARRON, D.

BEBBINGTON, H. and WEBBER, B.G.

BEN-YISHAY, Y. and DILLER, L.

BERG, H.V.
BIANCO, K.M.


BLAKE, L.K.

BLUMENREICH, O.A.

BORDEN, L.P.


BRIDGE, W. and CLARK, J.M. (eds.).

BRIGNALL, L.

Closed Head Injury: Psychological, Social, and Family Consequences. Oxford University Press.

The Sisters-In-Charge of Hospital Wards - an appraisal. Pretoria: UNISA publications.


Buckling up leads to more head injuries. Medical Chronicle, January 1986. 18: Col. 3-5.


BUZZARD, R.B.


COPE, D.N. and HALL, K.

The Research Process in Nursing.
Blackwell Scientific Publications.

Writing for Nursing and Allied Professions.
United Kingdom: Blackwell Scientific Publications.

CURTIS, C.

DAVIDOFF, G. et al.

DAVITT, P.A.

DE VILLIERS, J.C. et al.

Research in Nursing Practice.

DODD, M.J.

Nursing Audit.

Issues in Nursing Research.

ELLIOTT, F.C.

FELTON, G. et al.

FERRY, G.
FIFE, D., and JAGGER, J.

FINE, R.B.

PLANAGAN, J.C.

PFEERMAN, J.M.

FRY, B.A.

FULLER, C., and YOUNG, C.

GAMMAGE, S.L., et al.

GANONG, W.L., et al.

GENTLEMAN, D., and TEASDALE, G.

GEORGOPOULOS, B.S., and CHRISTMAN, L.

GLOAG, D.

GOLIGHER, L.
GOOCH, J.

GOODMAN-SMITH, A. and TURNBULL, J.


GRUFFITH, N.L. and MIGUEL, M.E.

*Basic Human Physiology.*
Philadelphia: W.B. Saunders Company.

HALL, K., et al.

HAMMOND-TOOKE, G.

HARRISON, M.

HARRISON, V.

HELA, N.

HIWITT, P.S.


HILL, R.P. et al. (1982).
*Nursing Decisions - Experiences in Clinical Problem Solving. Surgical Nursing - Vol. 2*.

HILLS, G.

HOLMES, T.H. and RAHE, R.H.
HOOLEY, O.G.

HOPKINS, G.O. et al.

HORDER, J.

HUGO, E. et al.

HUGO, M.


IRVING, C. and WALKER, N.

JACKSON, G.E.N. (1985)
An Evaluation of the Quality of Nursing Received by Patients in Selected Hospital Units. A dissertation submitted to the Faculty of Medicine, University of the Witwatersrand, Johannesburg.

JARVIS, B.M.

JELINEK, B.C. et al. (1971).


KURUP, C.P.B.,

KVIZ, F.J. and KNAF, K.A. (1980),
Statistics for Nurses. An introductory text.

LEACH, J. et al.
Adopting a quality assurance program. Dimensions in Health Services, April 1981 : 30/52.

LEDINGHAM, I. Mc A. (ed.) (1977),
Recent Advances in Intensive Therapy.

LENNINGER, M. (1981),

LEVINE, A.S. (1981),
(From "A conference on the future of Nursing Care")

LIAN, W.A.,

LINCOLN, N.B. et al.,

LOCKETT, R.W.,

LOUIS, M.C. and POYSE, S.M.,

MACRUHY, B. and HESLOP, T.


MAHIB, A.B.,

MARSALAND, E.A.,
Reflections of a disabled professional. Physiotherapy, April 1981. 67(4) : 97-100.
MARTIN, P.J.  

MASTRIAN, K.G.  


MC CULLOCK MELNYK, K.A.  

McDERMOTT, F.T. and KLUG, G.L.  

MCLEAUGHLIN, P.B.  

McMANUS, R.L.  

McNAMARA, M. and QUINN, C.  

McPHAIL, C.  

MELIA, K.M.  

MELLISH, J.M.  

MILLER, J.D.  

MITCHELL, P.H. et al.  
