

Acetylcysteine IV

(also known as N-Acetylcysteine, NAC)

CAUTION: High Administration Risk Rating

CAUTION: Acetylcysteine is administered as a loading dose over 2 hours followed by a maintenance dose.

This information applies to ORAL paracetamol overdoses in adults, for INTRAVENOUS paracetamol overdoses contact the National Poisons Information Centre (NPIC) (01 8092566)

- See [TOXBASE](#) to determine the management of the patient depending on the number of hours since ingestion.
- If Acetylcysteine is indicated, follow the tables below

This monograph is for preparation of **intravenous acetylcysteine**
For nebulised administration see **Acetylcysteine nebulised**

| Form | 2g per 10mL ampoule (Parvolex®) (200mg per mL) | Store below 25°C. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------|--|-------------------|---------------------------------|---------------|--|--|--|-----------------|----------------|--|-----------------|--|----------------|-------|--|--------|--|----------------------|---------|--|----------|--|-----------|----------|--|----------|--|-----------------------------|-----------------------------|---------------|-----------------------------|---------------|----|----|---------|----|---------|-------|----|-----|----|-----|-------|----|-----|----|-----|-------|----|-----|----|-----|-------|----|-----|----|-----|-------|----|-----|----|-----|-------|----|-----|----|-----|---------|----|-----|-----|-----|------|----|-----|-----|
| Reconstitution | Already in solution <ul style="list-style-type: none">• Draw up using a 5 micron filter needle• Use gloves when opening ampoules Dilute further before administration | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Compatibility & Stability | Glucose 5% (preferred) Sodium Chloride 0.9% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Administration | IV Infusion – SNAP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | SNAP (Scottish and Newcastle Acetylcysteine Protocol) (Also known as Modified 12-hour regimen) For Adults ≥40kg – see table below | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | First infusion (100mg/kg, max 11g) <ul style="list-style-type: none">• Remove 50mL from a 250mL infusion bag• Add required dose to 200mL infusion fluid• Infuse over 2 hours | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Second Infusion (200mg/kg, max 22g) <ul style="list-style-type: none">• Add required dose to 1000mL infusion fluid• Infuse over next 10 hours | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <table><tr><th colspan="5">Acetylcysteine for Adults ≥40kg</th></tr><tr><th>12-hour Regimen</th><th colspan="2">First infusion</th><th colspan="2">Second Infusion</th></tr><tr><td>Infusion fluid</td><td colspan="2">200mL</td><td colspan="2">1000mL</td></tr><tr><td>Duration of infusion</td><td colspan="2">2 hours</td><td colspan="2">10 hours</td></tr><tr><td>Drug dose</td><td colspan="2">100mg/kg</td><td colspan="2">200mg/kg</td></tr><tr><th>Patient weight¹</th><th>Ampoule volume²</th><th>Infusion Rate</th><th>Ampoule volume²</th><th>Infusion Rate</th></tr><tr><td>kg</td><td>mL</td><td>mL/hour</td><td>mL</td><td>mL/hour</td></tr><tr><td>40-49</td><td>23</td><td>112</td><td>45</td><td>105</td></tr><tr><td>50-59</td><td>28</td><td>114</td><td>55</td><td>106</td></tr><tr><td>60-69</td><td>33</td><td>117</td><td>65</td><td>107</td></tr><tr><td>70-79</td><td>38</td><td>119</td><td>75</td><td>108</td></tr><tr><td>80-89</td><td>43</td><td>122</td><td>85</td><td>109</td></tr><tr><td>90-99</td><td>48</td><td>124</td><td>95</td><td>110</td></tr><tr><td>100-109</td><td>53</td><td>127</td><td>105</td><td>111</td></tr><tr><td>≥110</td><td>55</td><td>128</td><td>110</td><td>111</td></tr></table> | | Acetylcysteine for Adults ≥40kg | | | | | 12-hour Regimen | First infusion | | Second Infusion | | Infusion fluid | 200mL | | 1000mL | | Duration of infusion | 2 hours | | 10 hours | | Drug dose | 100mg/kg | | 200mg/kg | | Patient weight ¹ | Ampoule volume ² | Infusion Rate | Ampoule volume ² | Infusion Rate | kg | mL | mL/hour | mL | mL/hour | 40-49 | 23 | 112 | 45 | 105 | 50-59 | 28 | 114 | 55 | 106 | 60-69 | 33 | 117 | 65 | 107 | 70-79 | 38 | 119 | 75 | 108 | 80-89 | 43 | 122 | 85 | 109 | 90-99 | 48 | 124 | 95 | 110 | 100-109 | 53 | 127 | 105 | 111 | ≥110 | 55 | 128 | 110 |
| Acetylcysteine for Adults ≥40kg | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12-hour Regimen | First infusion | | Second Infusion | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Infusion fluid | 200mL | | 1000mL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Duration of infusion | 2 hours | | 10 hours | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Drug dose | 100mg/kg | | 200mg/kg | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Patient weight ¹ | Ampoule volume ² | Infusion Rate | Ampoule volume ² | Infusion Rate | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| kg | mL | mL/hour | mL | mL/hour | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 40-49 | 23 | 112 | 45 | 105 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 50-59 | 28 | 114 | 55 | 106 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 60-69 | 33 | 117 | 65 | 107 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 70-79 | 38 | 119 | 75 | 108 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 80-89 | 43 | 122 | 85 | 109 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 90-99 | 48 | 124 | 95 | 110 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 100-109 | 53 | 127 | 105 | 111 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ≥110 | 55 | 128 | 110 | 111 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

¹Dose calculations are based on weight in middle of each band.

²Figures have been rounded up to the nearest whole number.

This information has been summarised to act as a guide for those administering IV medication. The monograph should be used in conjunction with the drug data sheet and BNF for information on dose, adverse effects, cautions and contra-indications. Further information is available from Pharmacy on 22146 or 22542

| | <p>For Adults <40kg see table below</p> <p>The volume of infusion fluid has been modified to take patient weight into account, as fluid overload is a potential danger</p> <p>First infusion (100mg/kg)</p> <ul style="list-style-type: none">Pts 20-39.9kg Prepare 50mg/mL solution; Add TWO 10mL ampoules NAC to 60mL of diluent (total volume = 80mL) & infuse appropriate volume for patient weight – see table below <p>Second Infusion (200mg/kg)</p> <ul style="list-style-type: none">Pts 20-29kg Prepare 10mg/mL solution; Remove 430mL from 1000mL bag to leave 570mL diluent. Add THREE 10mL ampoules NAC to 570mL (total volume = 600mL) & infuse appropriate volume for patient weightPts 30-39.9kg Prepare 10mg/mL solution; Remove 240mL from 1000mL bag to leave 760 mL diluent. Add FOUR 10mL ampoules to 760mL of diluent (total volume = 800mL) & infuse appropriate volume for patient weight <table><tr><th colspan="5">Acetylcysteine for Adults <40kg</th></tr><tr><th>12-hour Regimen</th><th colspan="2">First infusion</th><th colspan="2">Second Infusion</th></tr><tr><th>Concentration</th><td colspan="2">50mg/mL</td><td colspan="2">10mg/mL</td></tr><tr><th>Duration of infusion</th><td colspan="2">2 hours</td><td colspan="2">10 hours</td></tr><tr><th>Drug dose</th><td colspan="2">100mg/kg</td><td colspan="2">200mg/kg</td></tr><tr><th>Patient weight¹</th><th>Infusion volume²</th><th>Infusion Rate</th><th>Infusion volume²</th><th>Infusion Rate</th></tr><tr><th>kg</th><th>mL</th><th>mL/hour</th><th>mL</th><th>mL/hour</th></tr><tr><td>20-24</td><td>44</td><td>22</td><td>440</td><td>44</td></tr><tr><td>25-29</td><td>54</td><td>27</td><td>540</td><td>54</td></tr><tr><td>30-34</td><td>64</td><td>32</td><td>640</td><td>64</td></tr><tr><td>35-39</td><td>74</td><td>37</td><td>740</td><td>74</td></tr></table> <p>¹Dose calculations are based on weight in middle of each band. ²Figures have been rounded up to the nearest whole number.</p> | Acetylcysteine for Adults <40kg | | | | | 12-hour Regimen | First infusion | | Second Infusion | | Concentration | 50mg/mL | | 10mg/mL | | Duration of infusion | 2 hours | | 10 hours | | Drug dose | 100mg/kg | | 200mg/kg | | Patient weight ¹ | Infusion volume ² | Infusion Rate | Infusion volume ² | Infusion Rate | kg | mL | mL/hour | mL | mL/hour | 20-24 | 44 | 22 | 440 | 44 | 25-29 | 54 | 27 | 540 | 54 | 30-34 | 64 | 32 | 640 | 64 | 35-39 | 74 | 37 | 740 | 74 |
|---|---|---------------------------------|------------------------------|---------------|--|--|-----------------|----------------|--|-----------------|--|---------------|---------|--|---------|--|----------------------|---------|--|----------|--|-----------|----------|--|----------|--|-----------------------------|------------------------------|---------------|------------------------------|---------------|----|----|---------|----|---------|-------|----|----|-----|----|-------|----|----|-----|----|-------|----|----|-----|----|-------|----|----|-----|----|
| Acetylcysteine for Adults <40kg | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12-hour Regimen | First infusion | | Second Infusion | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Concentration | 50mg/mL | | 10mg/mL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Duration of infusion | 2 hours | | 10 hours | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Drug dose | 100mg/kg | | 200mg/kg | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Patient weight ¹ | Infusion volume ² | Infusion Rate | Infusion volume ² | Infusion Rate | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| kg | mL | mL/hour | mL | mL/hour | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20-24 | 44 | 22 | 440 | 44 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25-29 | 54 | 27 | 540 | 54 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30-34 | 64 | 32 | 640 | 64 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 35-39 | 74 | 37 | 740 | 74 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Specialist advice on those with liver disease. | <p>Discuss (with liver unit) if any of below:</p> <ul style="list-style-type: none">ALT > 1000 u/LINR >3.0↑ creatinineAcidosis or encephalopathy↓BP (MAP < 60 mmHg)Pre-existing liver disease | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Adverse reactions | <p>Anaphylactoid reactions may occur, particularly with initial loading dose. Patient should be carefully observed.</p> <ul style="list-style-type: none">Temporarily stopping the acetylcysteine may be all that is required.Consider an H₁ antihistamine (e.g. chlorphenamine 10 mg IV) and nebulised salbutamol if bronchospasm is present.It is essential that the acetylcysteine infusion is restarted once the reaction has settled. Consider slowing the infusion rate (e.g. administer the first bag over twice as long as usual. The normal infusion rate can be used for subsequent bags). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Monitoring | <ul style="list-style-type: none">Check bloods (LFTs, INR, U&E, P&S, FBC) 2 hrs before second infusion due to end <p>Can discontinue after the 2nd infusion if:</p> <ul style="list-style-type: none">INR ≤ 1.3 andALT is normal andParacetamol conc. < 10 mg/L and | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| | <ul style="list-style-type: none"> • Patient has no symptoms suggesting liver damage <p>If all of these criteria are not met:</p> <ul style="list-style-type: none"> • Initiate a 3rd infusion of NAC at the same dose and rate as the 2nd infusion. i.e. 200mg/kg over 10 hours • Repeat bloods again after a further 10 hours of treatment <p>Stop treatment after 3rd infusion (22 hours after commencing NAC) if:</p> <ul style="list-style-type: none"> • INR \leq 1.3 and • ALT < x2 upper limit of normal and • ALT < x2 the admission measurement <p>If all of these criteria are not met:</p> <ul style="list-style-type: none"> • Initiate a 4th infusion at same dose and rate • Discuss with NPIS • Discuss with Liver unit if not already involved |
| Extravasation | <p>The first infusion has a high osmolarity and may cause venous irritation and tissue damage in cases of extravasation. If a central venous access device is unavailable, administer via a large peripheral vein monitoring insertion site closely using a recognised phlebitis scoring tool. Re-site cannula at first signs of inflammation.</p> |
| Additional Information | <ul style="list-style-type: none"> • SNAP (modified 12-hour regimen) is an off label use of acetylcysteine albeit at its licensed dose. This regimen is endorsed by National Poisons Information Service (NPIS) and the Royal College of Emergency Medicine: see Toxbase (username/password required, available Resusc room ED) • A ceiling weight of 110kg should be used when calculating the acetylcysteine dose for paracetamol poisoning in obese patients. • NPIS advises that for pregnant patients the toxic dose should be calculated using the patient's pre-pregnancy weight and the acetylcysteine dose (both regimens) should be calculated using the patient's actual pregnant weight. • NB: Due to the dialysability of acetylcysteine for patients on renal replacement therapy the dose of acetylcysteine should be doubled. (Toxbase, UpToDate, RDD) • Paracetamol overdose in Children: see Toxbase for standard 21 hour regimen |

Information provided relates to Parvolex® (Phoenix Labs)