Survey of injuries among West End performers

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Abstract

Objectives—To obtain more information about injuries of West End performers.

Methods—A retrospective survey of 269 performers appearing in 20 West End productions (12 dramas and eight musicals).

Results—In current productions, 46% of all performers sustained at least one injury for an average of 0.87 injuries per performer. Lower extremity injuries were the most common for dancers (52.2% of injuries) and actors (43.2%) with neck and back injuries the second most common. Sprains and strains were the most common diagnoses. 61% of performers thought that their injuries were preventable. Most performers consulted non-physician healthcare providers. Factors significantly influencing the risk of injuries for performers include female sex, a history of previous injuries, missed performances due to previous injuries, more physically demanding roles, and performing on raked (angled) stages.

Conclusion—West End performers commonly sustain injuries. Although primary prevention of most theatrical injuries is not possible, modification of raked stages may reduce the incidence. This study may be helpful to the growing number of healthcare providers who practice performing arts medicine and may stimulate additional concern and research in the medical and theatrical communities about the performance injuries of professionals, amateurs, and theatrical students worldwide.

Keywords: injuries; dancers; actors

For the audience, West End productions can offer insightful and witty dialogue, inspiring and enthralling music, and seemingly effortless, dazzling dancing by some of the world's outstanding performers. Behind the glamour and glitz, however, is a highly stressful workplace where the performers can sustain a variety of occupational injuries. After our recent study on the prevalence and risk factors for theatrical injuries in 23 Broadway companies, we performed a similar survey of West End companies.

Methods

SAMPLING
The study was performed with the cooperation of the staff and members of the British Actors' Equity Association who selected 20 West End theatrical productions in London chosen for a mixture of dramas and musicals for the survey (table 1). The productions are 12 dramas and eight musicals. The deputy of each company distributed the survey to all cast members on various dates in February 1996. An attached letter from the Association introduced and endorsed the survey. The respondent could either mail in their anonymously completed questionnaire to the Association or give it to the deputy to send in. The number of respondents was 269 out of 379 total cast members (71%).

SOURCES OF ERROR AND BIAS
Retrospective surveys of injury, including this one, present potential problems with the accuracy of the respondents' recollections. As their occupations are at risk, professional performers may be especially likely to remember their injuries. Additionally, the assurance of anonymity may also have encouraged candor in the responses. The injury rate may be slightly higher than described as disabled performers were not included in the survey. About five to 10 performers a year in all West End productions are disabled from injuries and not able to complete their contracts.

The overall response rate of 71%, with the response rates of the cast members in various productions ranging from 44.4% to 100%, is another potential source of bias. However, the degree to which the productions had a response rate above or below the mean for the sample was not significantly related to the number of injuries sustained in their current production ($F_{1,19}=0.43, p=0.52$) or to whether they sustained an injury in their current production ($F_{1,19}=0.25, p=0.63$). Likewise, having a 100% response rate versus a less than perfect response rate was unrelated to the number of injuries ($F_{1,19}=1.9, p=0.19$) or whether the performer sustained an injury ($F_{1,19}=0.11, p=0.75$). These findings suggest that the non-respondents may be similar to the respondents.

STATISTICAL ANALYSIS AND VARIABLE SELECTION
The survey questionnaire (appendix) consisted of self reported items designed to provide information about theatrical injuries and possible risk factors. The questionnaire was based on our Broadway survey with input from an official of the British Actors' Equity Association (Hilary Strange, Senior West End Theatre Organiser). In the covering letter from the British Actors' Equity Association, injury was defined as follows: "Injury constitutes any theatre-related injury resulting in physical damage to the person. Please report any injuries you have sustained even those not resulting in missed performances."

For the initial risk factor analysis, unconditional logistic regression was used to generate
odds ratios (ORs) for predictor variables, adjusted for the following covariates: number of weeks with the current production; number of performances with the current production; and number of minutes on stage each performance. Continuous predictors (height, age, etc), were categorised by quartiles of their distributions. The outcome for all analyses was whether the respondent indicated that they had been injured over the course of their current production.

As recommended when developing multi-variable logistic regression models through stepwise procedures, all variables that predicted injury with even moderate probability of significance (p<0.25) were further tested with a criterion for inclusion in the final model being more restrictive (p<0.15). These selected models were further expanded by the forced inclusion of the three covariates implemented in the earlier risk factor analysis.

## Results

### Characteristics of the Study Population

Table 1 presents the demographic characteristics of the performers. The performers sustained 2.4 injuries per 1000 performances and 2.1 injuries per 1000 hours performing on stage during their current production. For dancers and actors, respectively, 18.5% and 43.1% of injuries resulted in at least one missed performance. For the three most recent injuries, 60.8% of all performers thought that their injuries were preventable.

### Risk Factors for Injury

The initial risk factor analysis identified various risk factors that significantly influence the risk of injury for performers (table 3): the performer’s sex; age; age when they began instruction; duration as professional; previously injured; previously missed performing due to injury; physical demands of the role; and amount of choreography in the show.

As actors and dancers may have different patterns of risk factors, a series of pairwise interactions with the type of performer and each predictor were modelled after the initial models (table 3). Of these moderating effects tested, the following were significant (p<0.05): sex, age, height, body mass, duration as professional, previously injured, previously missed performing due to injury; currently smoker; and performed on a raked (angled) stage. Male sex (OR (95% confidence interval (95% CI)) 0.5 (0.3 to 0.9) and 0.5 (0.1 to 2.6) in actors and dancers, respectively), older age (OR (95% CI) 0.3 (0.1 to 0.6) and 1.8 (0.4 to 7.8) in actors and dancers, respectively).

## Table 1  Productions surveyed and demographics of West End performers

<table>
<thead>
<tr>
<th>Production</th>
<th>Questionnaires returned (%)</th>
<th>Respondents (n)</th>
<th>Mean weeks in production</th>
<th>Mean physical demands*</th>
<th>Mean injuries / performer</th>
<th>Injured during production (%)</th>
<th>Size of rake† (%)</th>
<th>Choreography in show**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oliver</td>
<td>78</td>
<td>29</td>
<td>22.4</td>
<td>2.69</td>
<td>0.83</td>
<td>57</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>Mousetrap</td>
<td>54</td>
<td>07</td>
<td>24.1</td>
<td>2.00</td>
<td>0.14</td>
<td>14</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Buddy</td>
<td>67</td>
<td>16</td>
<td>76.6</td>
<td>3.19</td>
<td>0.94</td>
<td>44</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fame</td>
<td>63</td>
<td>20</td>
<td>27.7</td>
<td>2.80</td>
<td>0.65</td>
<td>35</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Blood brothers</td>
<td>86</td>
<td>12</td>
<td>91.9</td>
<td>3.27</td>
<td>1.33</td>
<td>83</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Les miserables</td>
<td>69</td>
<td>22</td>
<td>75.6</td>
<td>3.50</td>
<td>1.80</td>
<td>77</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Only the lonely</td>
<td>53</td>
<td>08</td>
<td>37.4</td>
<td>2.63</td>
<td>0.13</td>
<td>13</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Phantom of the opera</td>
<td>67</td>
<td>24</td>
<td>83.9</td>
<td>2.63</td>
<td>0.75</td>
<td>50</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Communicating doors</td>
<td>80</td>
<td>08</td>
<td>24.6</td>
<td>3.36</td>
<td>0.63</td>
<td>38</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Dead funny</td>
<td>44</td>
<td>04</td>
<td>14.0</td>
<td>2.25</td>
<td>0.00</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>The hot house</td>
<td>70</td>
<td>07</td>
<td>10.3</td>
<td>1.67</td>
<td>0.00</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Jolson</td>
<td>53</td>
<td>16</td>
<td>15.0</td>
<td>2.38</td>
<td>0.75</td>
<td>50</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Indian ink</td>
<td>67</td>
<td>12</td>
<td>34.4</td>
<td>1.67</td>
<td>0.00</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>An inspector calls</td>
<td>71</td>
<td>05</td>
<td>23.4</td>
<td>3.40</td>
<td>0.00</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>The master builder</td>
<td>55</td>
<td>06</td>
<td>17.0</td>
<td>1.67</td>
<td>0.00</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mack and mabel</td>
<td>100</td>
<td>27</td>
<td>11.2</td>
<td>3.07</td>
<td>0.56</td>
<td>46</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Starlight express</td>
<td>100</td>
<td>21</td>
<td>153.4</td>
<td>4.40</td>
<td>2.95</td>
<td>81</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>The wind in the willows</td>
<td>70</td>
<td>14</td>
<td>7.4</td>
<td>3.43</td>
<td>0.57</td>
<td>57</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>The women in black</td>
<td>100</td>
<td>05</td>
<td>174.5</td>
<td>2.20</td>
<td>0.00</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Tommy Steele</td>
<td>63</td>
<td>05</td>
<td>33.6</td>
<td>3.80</td>
<td>0.80</td>
<td>80</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>71.0</td>
<td>269</td>
<td>49.4</td>
<td>2.93</td>
<td>0.87</td>
<td>46</td>
<td>3</td>
<td>1.4</td>
</tr>
</tbody>
</table>

*Mean physical demands is a self rating that ranged from 1 (least) to 5 (most).
†These data were provided by the British Actors’ Equity Association. Choreography in show ranged from 0 (none) to 3 (heavy).
**On a raked (angled) stage.

## Table 2  Demographics of West End performers surveyed

<table>
<thead>
<tr>
<th>Gender</th>
<th>Dancers (n=102)</th>
<th>Men (n=167)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dancers (n=27)</td>
<td>Actors (n=75)</td>
</tr>
<tr>
<td>Age (y)</td>
<td>25.8 (5.4)</td>
<td>33.1 (9.5)</td>
</tr>
<tr>
<td>Age began instruction (y)</td>
<td>6.5 (3.1)</td>
<td>12.9 (5.7)</td>
</tr>
<tr>
<td>Duration as professional (y)</td>
<td>8.4 (5.9)</td>
<td>12.8 (9.2)</td>
</tr>
<tr>
<td>Height (m)</td>
<td>1.64 (0.07)</td>
<td>1.63 (0.06)</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>53.3 (4.4)</td>
<td>57.1 (8.5)</td>
</tr>
<tr>
<td>Body mass index (kg/m²)</td>
<td>19.9 (1.5)</td>
<td>21.6 (3.3)</td>
</tr>
<tr>
<td>Injuries as performer (n)</td>
<td>5.7 (6.7)</td>
<td>3.9 (4.5)</td>
</tr>
<tr>
<td>Injuries in current production (n)</td>
<td>1.2 (1.5)</td>
<td>0.8 (1.0)</td>
</tr>
<tr>
<td>Time missed owing to all injuries (performances)</td>
<td>38.1 (85.0)</td>
<td>3.6 (35.3)</td>
</tr>
<tr>
<td>Time missed owing to current production injuries (performances)</td>
<td>8.2 (26.1)</td>
<td>0.9 (2.3)</td>
</tr>
<tr>
<td>Warms up before performing (%)</td>
<td>67</td>
<td>55</td>
</tr>
<tr>
<td>Currently exercising (%)</td>
<td>48</td>
<td>48</td>
</tr>
<tr>
<td>Currently in dance or acting classes (%)</td>
<td>48</td>
<td>35</td>
</tr>
<tr>
<td>Smokes cigarettes (%)</td>
<td>22</td>
<td>23</td>
</tr>
</tbody>
</table>
Survey of injuries among West End performers

<table>
<thead>
<tr>
<th>Table 3 Analysis of risk factors for injury in the current production (n=269)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demographic variables:</strong></td>
</tr>
<tr>
<td><strong>Male</strong></td>
</tr>
<tr>
<td><strong>Dancer</strong></td>
</tr>
<tr>
<td><strong>Age</strong></td>
</tr>
<tr>
<td><strong>Older</strong></td>
</tr>
<tr>
<td><strong>Younger</strong></td>
</tr>
<tr>
<td><strong>Height:</strong></td>
</tr>
<tr>
<td><strong>Taller</strong></td>
</tr>
<tr>
<td><strong>Weight:</strong></td>
</tr>
<tr>
<td><strong>Lesser</strong></td>
</tr>
<tr>
<td><strong>Body mass:</strong></td>
</tr>
<tr>
<td><strong>Lesser</strong></td>
</tr>
<tr>
<td><strong>Career variables:</strong></td>
</tr>
<tr>
<td><strong>Age began instruction:</strong></td>
</tr>
<tr>
<td><strong>Earlier</strong></td>
</tr>
<tr>
<td><strong>Duration as professional:</strong></td>
</tr>
<tr>
<td><strong>Longer</strong></td>
</tr>
<tr>
<td><strong>Shorter</strong></td>
</tr>
<tr>
<td><strong>Previously injured</strong></td>
</tr>
<tr>
<td><strong>Training or preparation variables:</strong></td>
</tr>
<tr>
<td><strong>Currently exercising</strong></td>
</tr>
<tr>
<td><strong>Currently in dance or acting classes</strong></td>
</tr>
<tr>
<td><strong>Warms up before performing</strong></td>
</tr>
<tr>
<td><strong>Currently smokes</strong></td>
</tr>
<tr>
<td><strong>Production feature variables:</strong></td>
</tr>
<tr>
<td><strong>Physical demands of their role:</strong></td>
</tr>
<tr>
<td><strong>&gt;3</strong></td>
</tr>
<tr>
<td><strong>≤2</strong></td>
</tr>
<tr>
<td><strong>Amount of choreography in show:</strong></td>
</tr>
<tr>
<td><strong>&gt;3</strong></td>
</tr>
<tr>
<td><strong>≤1</strong></td>
</tr>
<tr>
<td><strong>Performed on a raked stage</strong></td>
</tr>
</tbody>
</table>

Results were calculated with single predictor logistic models with control for the number of performances with that production, weeks with that production, and minutes on stage per show. Of the total sample, 124 were injured during their current production. The continuous risk factors were coded into two additional binary variables reflecting the two extreme quartiles of risk factor distributions in reference to the sex specific norm of each type of performer. Physical demands ranged from 1 (least) to 5 (most). Amount of choreography ranged from 0 (none) to 3 (heavy).

* *p<0.05 Wald statistics.

Results from the final unconditional logistic regression model with covariates that included number of performances with that production, weeks with that production, minutes on stage each show, and all other variables presented in this table.

<table>
<thead>
<tr>
<th>Table 4 Multivariate analysis of risk factors for injury in the current production (n=269)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Variables</strong></td>
</tr>
<tr>
<td><strong>Male</strong></td>
</tr>
<tr>
<td><strong>Older age</strong></td>
</tr>
<tr>
<td><strong>Begun instruction earlier</strong></td>
</tr>
<tr>
<td><strong>Shorter duration as professional</strong></td>
</tr>
<tr>
<td><strong>Previously injured</strong></td>
</tr>
<tr>
<td><strong>Warms up before performing</strong></td>
</tr>
<tr>
<td><strong>Most (&gt;3) physically demanding role</strong></td>
</tr>
<tr>
<td><strong>Least (&lt;2) physically demanding role</strong></td>
</tr>
<tr>
<td><strong>Highest (&gt;2) amount of choreography in show</strong></td>
</tr>
<tr>
<td><strong>Least (&lt;1) amount of choreography in show</strong></td>
</tr>
<tr>
<td><strong>Performed on a raked stage</strong></td>
</tr>
</tbody>
</table>

Results from the final unconditional logistic regression model with covariates that included number of performances with that production, weeks with that production, minutes on stage each show, and all other variables presented in this table.

* *p<0.05 Wald statistics.

Discussions

The injuries of dancers are also consistent with earlier studies of professional ballet dancers in the United States’ and professional dancers of classical ballet and modern dance in the United Kingdom. The injuries of dancers are also consistent with earlier studies of professional ballet dancers in the United States’ and professional dancers of classical ballet and modern dance in the United Kingdom. As in the Broadway survey, 60.8% of all West End performers thought that their injuries were preventable. Most Broadway and West End performers saw non-physicians for their injuries. Although there is widespread use of non-physician providers...
among the general population in the United States, this is not the case in the United Kingdom. Performers may wish to obtain rapidly available physical treatments.

Several variables influence the likelihood of injury for performers. In both the West End and Broadway, performers with the highest level of physical demands are at increased risk of injury by a factor of about 3. In this survey, dancers in productions with greater amounts of choreography were 2.1 times more likely to sustain injuries. A history of previous injuries and previously missed performances due to injury also significantly increased the risk of injuries for actors in the current production. As in the Broadway survey, women performers are more likely to sustain injuries than men.

Although the explanation is not known, wearing high heeled shoes may contribute.

A raked stage is a stage that is angled down toward the audience to improve the view. The percentage of the slope in the productions surveyed ranged from 3% to 10%. Raked stages can lead to increased injuries because of the performers’ accommodating shift backwards in their centre of gravity. In the current study, performing on a raked stage was a significant risk factor for injury in actors only whereas on Broadway, performing on a raked stage was a significant risk factor for dancers but not actors. These findings may be explained by the presence of more actors and fewer dancers in the current study compared with the Broadway survey leading to differences in the power to detect significant relations.

This investigation may be useful for the growing number of physicians and other health professionals who are involved in performing arts medicine. Primary prevention is another application as one of the significant risk factors, raked stages, can be modified. With the findings from our Broadway survey, the 1996 production contract of the Actors’ Equity Association of the United States has recommended a maximum slope of no more than 7.5% and instituted a physiotherapy programme (Kenneth Greenwood of Actors’ Equity Association, personal communication). Also, this West End survey was influential in the West End production contract to be completed on 12 January 1998 (Hilary Strange of the British Actors’ Equity Association, personal communication). In a new clause, if a performer is required to work on a steeply raked stage, the employer will provide a “rake specialist” (usually a physiotherapist) to show performers how to work safely on a raked surface with an exercise programme and will provide continuous supervision and support. This study may also be helpful for the planning of

### Table 5 Sites of reported injuries

<table>
<thead>
<tr>
<th></th>
<th>Dancers (n=58) n (%)</th>
<th>Actors (n=211) n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>During this production:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower extremity injuries:</td>
<td>65 (17.4)</td>
<td>132 (16.2)</td>
</tr>
<tr>
<td>Hip</td>
<td>34 (52.3)</td>
<td>57 (43.2)</td>
</tr>
<tr>
<td>Groin</td>
<td>0 (0.0)</td>
<td>1 (0.8)</td>
</tr>
<tr>
<td>Thigh</td>
<td>3 (4.6)</td>
<td>3 (2.3)</td>
</tr>
<tr>
<td>Knee</td>
<td>11 (16.9)</td>
<td>26 (19.7)</td>
</tr>
<tr>
<td>Shin</td>
<td>0 (1.5)</td>
<td>5 (3.8)</td>
</tr>
<tr>
<td>Calf</td>
<td>0 (1.5)</td>
<td>1 (0.8)</td>
</tr>
<tr>
<td>Ankle</td>
<td>12 (18.5)</td>
<td>10 (7.6)</td>
</tr>
<tr>
<td>Foot or toe</td>
<td>3 (4.6)</td>
<td>8 (6.1)</td>
</tr>
<tr>
<td><strong>Neck and back injuries:</strong></td>
<td>22 (33.9)</td>
<td>28 (21.2)</td>
</tr>
<tr>
<td>Neck</td>
<td>7 (10.8)</td>
<td>4 (3.0)</td>
</tr>
<tr>
<td>Lower back</td>
<td>12 (18.5)</td>
<td>19 (11.4)</td>
</tr>
<tr>
<td>Mid (upper) back</td>
<td>3 (4.6)</td>
<td>9 (6.8)</td>
</tr>
<tr>
<td><strong>Other injuries:</strong></td>
<td>9 (15.9)</td>
<td>50 (37.9)</td>
</tr>
<tr>
<td>Head</td>
<td>1 (1.5)</td>
<td>15 (11.4)</td>
</tr>
<tr>
<td>Larynx (vocal cords)</td>
<td>1 (1.5)</td>
<td>15 (11.4)</td>
</tr>
<tr>
<td>Shoulder</td>
<td>2 (3.1)</td>
<td>5 (3.8)</td>
</tr>
<tr>
<td>Arm</td>
<td>1 (1.5)</td>
<td>5 (3.8)</td>
</tr>
<tr>
<td>Hand or finger</td>
<td>2 (3.1)</td>
<td>8 (6.1)</td>
</tr>
<tr>
<td>Rib cage</td>
<td>0 (0.0)</td>
<td>5 (3.8)</td>
</tr>
<tr>
<td>Multiple (sites)</td>
<td>1 (1.5)</td>
<td>5 (3.8)</td>
</tr>
<tr>
<td>Other</td>
<td>1 (1.5)</td>
<td>4 (3.0)</td>
</tr>
<tr>
<td><strong>Before production:</strong></td>
<td>367 (82.6)</td>
<td>681 (83.8)</td>
</tr>
<tr>
<td>Lower extremity</td>
<td>170 (46.3)</td>
<td>257 (37.7)</td>
</tr>
<tr>
<td>Neck and back</td>
<td>90 (24.5)</td>
<td>151 (22.2)</td>
</tr>
<tr>
<td>Other injuries</td>
<td>107 (39.2)</td>
<td>273 (40.1)</td>
</tr>
<tr>
<td><strong>Total number of injuries for current and past productions</strong></td>
<td>432</td>
<td>813</td>
</tr>
</tbody>
</table>

*These aggregated results were based on the entire history of injuries.

### Table 6 Healthcare providers seen and reported healthcare provider diagnosis for injuries during the current production

<table>
<thead>
<tr>
<th>Healthcare providers seen:</th>
<th>Dancers n (%)</th>
<th>Actors n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physiotherapist</td>
<td>48 (56.5)</td>
<td>52 (31.7)</td>
</tr>
<tr>
<td>Masseur</td>
<td>8 (9.4)</td>
<td>28 (17.1)</td>
</tr>
<tr>
<td>General practitioner</td>
<td>6 (7.1)</td>
<td>8 (4.9)</td>
</tr>
<tr>
<td>Osteopath</td>
<td>4 (4.7)</td>
<td>7 (4.3)</td>
</tr>
<tr>
<td>Acupuncturist</td>
<td>4 (4.7)</td>
<td>5 (3.1)</td>
</tr>
<tr>
<td>Podiatrist</td>
<td>2 (2.4)</td>
<td>4 (2.4)</td>
</tr>
<tr>
<td>Ear, nose, and throat</td>
<td>1 (1.2)</td>
<td>5 (3.1)</td>
</tr>
<tr>
<td>Other</td>
<td>2 (2.4)</td>
<td>2 (1.2)</td>
</tr>
<tr>
<td>None seen</td>
<td>7 (8.2)</td>
<td>6 (3.7)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>85 (100.0)</td>
<td>45 (27.4)</td>
</tr>
<tr>
<td><strong>Reported healthcare provider diagnosis:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sprain or strain</td>
<td>19 (38.8)</td>
<td>41 (51.9)</td>
</tr>
<tr>
<td>Pinched nerve</td>
<td>6 (12.2)</td>
<td>10 (12.7)</td>
</tr>
<tr>
<td>Inflammation (chronic)</td>
<td>8 (16.0)</td>
<td>5 (6.3)</td>
</tr>
<tr>
<td>Stress fracture</td>
<td>3 (6.1)</td>
<td>4 (5.1)</td>
</tr>
<tr>
<td>Contusion</td>
<td>2 (4.1)</td>
<td>3 (3.8)</td>
</tr>
<tr>
<td>Acute fracture</td>
<td>1 (2.0)</td>
<td>2 (2.5)</td>
</tr>
<tr>
<td>Dislocation</td>
<td>14 (28.6)</td>
<td>2 (2.5)</td>
</tr>
<tr>
<td>Snap or tear</td>
<td>2 (4.1)</td>
<td>1 (1.2)</td>
</tr>
<tr>
<td>Puncture or cut</td>
<td>1 (2.0)</td>
<td>1 (1.2)</td>
</tr>
<tr>
<td>Other</td>
<td>8 (10.1)</td>
<td>2 (2.5)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>49 (100.0)</td>
<td>79 (100.0)</td>
</tr>
</tbody>
</table>
healthcare provider needs by theatrical unions and production companies\(^1\) as well as for the evaluation and prevention of injuries to theatrical students and non-professionals worldwide.

We greatly appreciate the assistance and cooperation of the members and staff (Hilary Strange, Senior West End Theatre Organiser and Peter Finch, Assistant General Secretary) of the British Actors’ Equity Association.

### Survey of West End Performers

**Survey Marking Instructions**
For the multiple choice items, please mark only one oval for each question. Please write in the numbers within the dotted-lined boxes in response to a numeric question.

**PART 1: YOUR BACKGROUND**
1. What type of performer are you in your current production? Please mark the one that describes your major activity.
   - Dancer
   - Actor (including singing)
2. What is your date of birth and current age?
   - Date of birth: [ ] Month [ ] Day [ ] Year
   - Current Age: [ ]
3. What is your gender?
   - Female
   - Male
4. What is your height and weight?
   - Height: [ ] inches
   - Weight: [ ] pounds
5. At what age did you begin dancing, acting, or other performance-related instruction, and for how long have you been a professional performer?
   - Age began instruction: [ ]
   - Years as professional: [ ]
6. How many performing-related injuries have you sustained as a professional and as an amateur (before you began receiving any monetary compensation for performing)?
   - Total as an professional: [ ]
   - Total as an amateur: [ ]

**PART 2: ACTIVITIES & TRAINING**
7. Are you a regular cigarette smoker?
   - Yes
   - No
8a. Are you involved in an exercise or weight training regimen (activities)?
   - Yes
   - No (Skip to question 10)
   - How often do you participate in the following activities as part of your exercise regimen? Please mark for all activities.
     - [ ] Weekly
     - [ ] 1-3 times per week
     - [ ] 4 or more times per week
     - [ ] None or less
   - Weight training
   - Running
   - Swimming
   - Football
   - Tennis/Squash
   - Cricket
   - Rowing
   - Cycling
   - Aerobics
   - Other (please specify): [ ]
9a. Do you warm-up before a performance?
   - Yes
   - No
   - What type of warm-up do you do?
   - Stretch
   - Power (bar)
   - Other (please specify): [ ]

**PART 3: INFORMATION ABOUT YOUR CURRENT PRODUCTION**
10. In what production are you currently performing?
   - [ ] Cats
   - [ ] Five Guys Named Moe
   - [ ] Oliver
   - [ ] Blood Brothers
   - [ ] Mousetrap
   - [ ] Les Miserables
   - [ ] Buddy
   - [ ] Only the Lonely
   - [ ] Fame
   - [ ] Phantom of the Opera
   - [ ] Miss Saigon
   - [ ] Sunset Boulevard
   - [ ] Grease
   - [ ] Other (please specify): [ ]
11. Over the whole show an average, how would you rate the physical demands of your role?
   - Least Demanding
   - Most Demanding
   - (1)
   - (2)
   - (3)
   - (4)
   - (5)
12. How long have you been involved in this production? Please report both total weeks and total number of performances.
   - Weeks
   - Performances

**PART 4: INJURIES SUSTAINED IN YOUR CURRENT PRODUCTION**
17. How many injuries have you sustained over the course of this production and how many performances have they caused you to miss?
   - None (skip to question 21)
   - One injury
   - Two injuries
   - Three injuries
   - Four injuries
   - Five injuries
   - Six or more

For each of the 3 most recent injuries in your current production, please provide the following information. If you have more than 3 injuries, Injury One is your most recent injury, while Injury Two refers to the second most recent injury in your current production.

** ***** Injury One Information (most recent injury or your only injury in this production) *****

18a. Location of Injury One?
   - Head
   - Vocal chords
   - Throat
   - Neck
   - Shoulder
   - Arm
   - Wrist
   - Elbow
   - Hand
   - Finger(s)
   - Upper/lower back
   - Other (please specify): [ ]
   - How many times per week (0-9) have you been going to classes during this production?
   - (Note: This question pertains to only dance related classes for dancers, and only acting or voice related classes for actors.)
   - [ ]
19. What type of shoes do you wear in the performance?
   - High heel
   - Platforms
   - Ballet slippers
   - Boots
   - Tap shoes
   - Street shoes
   - Jazz/other dance shoes
   - No shoes
   - Other (please specify): [ ]
20. At what point in your current production did the injury occur, and about how many total performances did you miss due to this injury?
   - Weeks in the performance missed because of the injury
   - When the injury occurred

---

*Appendix: Survey questionnaire*
### Survey of West End Performers

**c. How did the injury occur?**
- Rehearsal
- Performance
- Show onset
- Classes
- Other (please specify)

**d. In how many shows did you perform while experiencing significant pain due to this injury?**
- 0
- 1
- 2-4
- 5-10
- 10 or greater

**e. Do you currently have any symptoms from this injury?**
- Yes
- No

**f. How long did you experience any symptoms due to this injury?**
- 0 days
- 1 day or less
- 10 days or less
- 1-2 weeks
- 2-4 weeks
- 4 weeks to 3 months
- 5-10 days
- Greater than 3 months

**g. Specifically, what type(s) of health care provider(s) did you consult about this injury? Please mark ALL THAT APPLY.**
- None
- Physiotherapist
- Orthopaedist
- General practitioner
- Neurologist
- Acupuncturist
- Other (please specify)

**h. If you consulted with a doctor or other health care provider, what was the primary diagnosis of this injury?**
- None
- No diagnosis
- Strain/strain
- Contracture
- Dislocation
- Pinched nerve
- Stress fracture
- Other (please specify)
- Chronic inflammation

**i. What specific tests were used to diagnose the injury? Please mark ALL THE TESTS THAT WERE USED.**
- None
- CAT scan
- MRI
- Other (please specify)

**e. Do you currently have any symptoms from this injury?**
- Yes
- No

### Survey of West End Performers

**3. If you had surgery because of this injury, what type of surgery was it?**
- None
- Surgery was performed (please specify the kind(s) of surgery)

**h. Did management provide treatment free of charge for this injury, and if so what? Please mark “0” if you did not perform in pain.**
- No
- Other (please specify)

**i. Are you currently claiming a claim for compensation for this injury through Equity?**
- Yes
- No

**m. If this injury could have been prevented, which of the following may have contributed to the occurrence of this injury? Please mark ALL THAT APPLY.**
- The injury could not have been prevented
- Poor shoes
- Rise of stairs
- Prevalence of foot/leg pain
- Other features of the set or stage
- Excessive demands from choreographer or director to have the overall performance shine
- Excessive physical demands required of the role you perform
- Features of the show’s choreography directing
- Puppies, etc.
- Other (please specify)

**b. Where did injury occur?**
- Head
- Vocal chords
- Hip/thigh
- Neck
- Upper leg/hip
- Shoulder
- Knee
- Arm
- Elbow
- Wrist
- Calf
- Finger(s)
- Toe(s)
- Lower back
- Other (please specify)

**b. If you consulted with a doctor or other health care provider, what was the primary diagnosis of this injury?**
- None
- No diagnosis
- Strain/strain
- Pinched nerve
- Stress fracture
- Other (please specify)

**b. If you performed in pain while experiencing significant pain due to this injury?**
- Yes
- No

**b. If you performed in pain while experiencing significant pain due to this injury?**
- Yes
- No
### SURVEY OF WEST END PERFORMERS

**PART 1: RELATED EXPERIENCES AND THOUGHTS ABOUT INJURIES**

1. Are you pursuing a claim for compensation for this injury through Equity?
   - **Yes**
   - **No**

2. If this injury could have been prevented, which of the following may have contributed to the occurrence of this injury? Please **Mark ALL THAT APPLY**.
   - The injury could not have been prevented
   - Poor design
   - Prevalence of fogging/smoke
   - Other features of the set or stage
   - Excessive demands from choreographer or director to have the performance shine
   - Excessive physical demands required of the role you perform
   - Features of the show's choreography or directing
   - Presence from other performers
   - Your having an inadequate warm-up
   - Your personal training habits/physical conditioning
   - Other personal or lifestyle factors (example include diet, sleep, stress, smoking)

3. Did management provide treatment free of charge for this injury and if so what?
   - **Please MARK ALL THAT APPLY**.
   - No services provided
   - Complimentary doctor
   - Complimentary physiotherapist
   - Complimentary massage
   - Other complimentary health care provider(s) [please specify__________]

4. Are you pursuing a claim for compensation for this injury through Equity?  
   - **Yes**
   - **No**

5. If this injury could have been prevented, which of the following may have contributed to the occurrence of this injury? Please **Mark ALL THAT APPLY**.
   - The injury could not have been prevented
   - Poor design
   - Prevalence of fogging/smoke
   - Other features of the set or stage
   - Excessive demands from choreographer or director to have the performance shine
   - Excessive physical demands required of the role you perform
   - Features of the show's choreography or directing
   - Presence from other performers
   - Your having an inadequate warm-up
   - Your personal training habits/physical conditioning

6. Specifically, what type(s) of health care provider(s) did you consult about this injury? Please **Mark ALL THAT APPLY**.
   - Other (please specify__________)

7. If you consulted with a doctor or other health care provider, what was the primary diagnosis of this injury?  
   - **No provider was seen**
   - **No diagnosis was made**
   - Strain/sprain
   - Contusion
   - Dislocation
   - Pinch fracture
   - Stress fracture
   - Other (please specify__________)
   - Chronic inflammation
   - Other (please specify__________)

8. What specific tests were used to diagnose the injury? Please **Mark ALL THE TESTS THAT WERE USED**.
   - **No provider was seen**
   - **No tests were used**
   - CAT scan
   - standard X-ray
   - Bone scan
   - MRI
   - Other:__________
   - Client noted that ankle or knee

9. If you had surgery because of this injury, what type of surgery was it?
   - **No surgery was performed**
   - Surgery was performed [please specify which kind(s) of surgery]__________

### SURVEY OF WEST END PERFORMERS

1. Did management provide treatment free of charge for this injury and if so what?
   - **Please MARK ALL THAT APPLY**.
   - No services provided
   - Complimentary doctor
   - Complimentary physiotherapist
   - Complimentary massage
   - Other complimentary health care provider(s) [please specify__________]

2. Are you pursuing a claim for compensation for this injury through Equity?  
   - **Yes**
   - **No**

3. If this injury could have been prevented, which of the following may have contributed to the occurrence of this injury? Please **Mark ALL THAT APPLY**.
   - The injury could not have been prevented
   - Poor design
   - Prevalence of fogging/smoke
   - Other features of the set or stage
   - Excessive demands from choreographer or director to have the performance shine
   - Excessive physical demands required of the role you perform
   - Features of the show's choreography or directing
   - Presence from other performers
   - Your having an inadequate warm-up
   - Your personal training habits/physical conditioning

4. Specifically, what type(s) of health care provider(s) did you consult about this injury? Please **Mark ALL THAT APPLY**.
   - Other (please specify__________)

5. If you consulted with a doctor or other health care provider, what was the primary diagnosis of this injury?  
   - **No provider was seen**
   - **No diagnosis was made**
   - Strain/sprain
   - Contusion
   - Dislocation
   - Pinch fracture
   - Stress fracture
   - Other (please specify__________)
   - Chronic inflammation
   - Other (please specify__________)

6. What specific tests were used to diagnose the injury? Please **Mark ALL THE TESTS THAT WERE USED**.
   - **No provider was seen**
   - **No tests were used**
   - CAT scan
   - standard X-ray
   - Bone scan
   - MRI
   - Other:__________
   - Client noted that ankle or knee

7. If you had surgery because of this injury, what type of surgery was it?
   - **No surgery was performed**
   - Surgery was performed [please specify which kind(s) of surgery]__________
### Survey of West End Performers

**23.** Do you feel that making a claim for compensation with Equity may be detrimental or "bad" to PERFORMERS' careers. 
- ( ) Not bad to their careers
- ( ) Possibly bad to their careers
- ( ) Definitely bad to their careers

**24.** Do you believe that warm-up before a performance is generally necessary? 
- ( ) Yes
- ( ) No

**25.** How often do you believe the following conditions MAY CONTRIBUTE TO PERFORMERS' INJURIES:
- a. Feature of choreography or direction that place performers at risk? 
  - ( ) Never
  - ( ) Seldom
  - ( ) Occasionally
  - ( ) Frequently
- b. Insufficient sleep? 
  - ( ) Never
  - ( ) Seldom
  - ( ) Occasionally
  - ( ) Frequently
- c. Cigarette smoking? 
  - ( ) Never
  - ( ) Seldom
  - ( ) Occasionally
  - ( ) Frequently
- d. Having role that push performers to their physical limits? 
  - ( ) Never
  - ( ) Seldom
  - ( ) Occasionally
  - ( ) Frequently
- e. Inadequate warm-up? 
  - ( ) Never
  - ( ) Seldom
  - ( ) Occasionally
  - ( ) Frequently
- f. Performance's ignoring physical fatigue? 
  - ( ) Never
  - ( ) Seldom
  - ( ) Occasionally
  - ( ) Frequently
- g. Insufficient physical conditioning? 
  - ( ) Never
  - ( ) Seldom
  - ( ) Occasionally
  - ( ) Frequently
- h. Performers' ignoring their own pain? 
  - ( ) Never
  - ( ) Seldom
  - ( ) Occasionally
  - ( ) Frequently
- i. Stress from a performer's personal life? 
  - ( ) Never
  - ( ) Seldom
  - ( ) Occasionally
  - ( ) Frequently
- j. Excessive pressure on performer by laborers to excel? 
  - ( ) Never
  - ( ) Seldom
  - ( ) Occasionally
  - ( ) Frequently
- k. Pressure by other performer? 
  - ( ) Never
  - ( ) Seldom
  - ( ) Occasionally
  - ( ) Frequently
- l. Poor nutrition or diet? 
  - ( ) Never
  - ( ) Seldom
  - ( ) Occasionally
  - ( ) Frequently
- m. Alcohol or drug consumption? 
  - ( ) Never
  - ( ) Seldom
  - ( ) Occasionally
  - ( ) Frequently
- n. Excessive demands by director/chorographer to have the overall performances shine? 
  - ( ) Never
  - ( ) Seldom
  - ( ) Occasionally
  - ( ) Frequently

**26.** Please estimate the chance that the following problems will be faced (within the next 12 months) by a performer comparable to yourself in experience, physical conditioning and expertise. 

<table>
<thead>
<tr>
<th>Problem</th>
<th>0</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
<th>80</th>
<th>90</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shown will be injured during training or exercising.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shown will sustain an injury that was caused by the mistakes of another person involved in the show.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shown will be severely injured from his/her own mistakes.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shown will miss 10 or more performances due to injury.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shown will be injured due to faulty props or equipment.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shown will sustain an injury that requires surgery.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shown will push themselves to the physical limits and sustain an injury.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**27.** How sure or confident are you that YOU PERSONALLY CAN PREVENT the following situations from occurring in the next 12 months: 

<table>
<thead>
<tr>
<th>Situation</th>
<th>Extremely sure</th>
<th>Sure</th>
<th>Unsure</th>
<th>Not Sure</th>
<th>Extremely unsure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Having an injury due to the deterioration of your technique or physical conditioning.</td>
<td>( ) 1</td>
<td>( ) 2</td>
<td>( ) 3</td>
<td>( ) 4</td>
<td>( ) 5</td>
</tr>
<tr>
<td>Having an injury due to your not taking precautions when you are fatigued.</td>
<td>( ) 1</td>
<td>( ) 2</td>
<td>( ) 3</td>
<td>( ) 4</td>
<td>( ) 5</td>
</tr>
<tr>
<td>Having an injury due to your own lack of concentration or caution.</td>
<td>( ) 1</td>
<td>( ) 2</td>
<td>( ) 3</td>
<td>( ) 4</td>
<td>( ) 5</td>
</tr>
<tr>
<td>Having an injury because more serious because of your not seeking therapy or consultation.</td>
<td>( ) 1</td>
<td>( ) 2</td>
<td>( ) 3</td>
<td>( ) 4</td>
<td>( ) 5</td>
</tr>
<tr>
<td>Having an injury because of having an inadequate warm-up or stretch.</td>
<td>( ) 1</td>
<td>( ) 2</td>
<td>( ) 3</td>
<td>( ) 4</td>
<td>( ) 5</td>
</tr>
<tr>
<td>Having an injury because you pushed yourself beyond your physical limits.</td>
<td>( ) 1</td>
<td>( ) 2</td>
<td>( ) 3</td>
<td>( ) 4</td>
<td>( ) 5</td>
</tr>
</tbody>
</table>

**Survey of West End Performers**

28. Please indicate how much you agree with each of the following items:

- a. I have excellent muscle tone.
  - ( ) Strongly disagree
  - ( ) Disagree
  - ( ) Neutral
  - ( ) Agree
  - ( ) Strongly agree
- b. If something can go wrong for me, it will.
  - ( ) Strongly disagree
  - ( ) Disagree
  - ( ) Neutral
  - ( ) Agree
  - ( ) Strongly agree
- c. There are lots of ways around any problem.
  - ( ) Strongly disagree
  - ( ) Disagree
  - ( ) Neutral
  - ( ) Agree
  - ( ) Strongly agree
- d. I'm always optimistic about my future.
  - ( ) Strongly disagree
  - ( ) Disagree
  - ( ) Neutral
  - ( ) Agree
  - ( ) Strongly agree
- e. Even when others get discouraged, I know that I can find a way to solve the problem.
  - ( ) Strongly disagree
  - ( ) Disagree
  - ( ) Neutral
  - ( ) Agree
  - ( ) Strongly agree
- f. I have excellent reflexes.
  - ( ) Strongly disagree
  - ( ) Disagree
  - ( ) Neutral
  - ( ) Agree
  - ( ) Strongly agree
- g. I rarely come up with good things happening to me.
  - ( ) Strongly disagree
  - ( ) Disagree
  - ( ) Neutral
  - ( ) Agree
  - ( ) Strongly agree
- h. My physique is rather strong.
  - ( ) Strongly disagree
  - ( ) Disagree
  - ( ) Neutral
  - ( ) Agree
  - ( ) Strongly agree
- i. Overall, I expect more good things to happen to me than bad.
  - ( ) Strongly disagree
  - ( ) Disagree
  - ( ) Neutral
  - ( ) Agree
  - ( ) Strongly agree
- j. I can think of many ways to get the things in life that are most important to me.
  - ( ) Strongly disagree
  - ( ) Disagree
  - ( ) Neutral
  - ( ) Agree
  - ( ) Strongly agree
- k. I hardly ever expect anything to go my way.
  - ( ) Strongly disagree
  - ( ) Disagree
  - ( ) Neutral
  - ( ) Agree
  - ( ) Strongly agree
- l. I can think of many ways to get out of a jam or "crut.
  - ( ) Strongly disagree
  - ( ) Disagree
  - ( ) Neutral
  - ( ) Agree
  - ( ) Strongly agree
- m. It is uncertain how long I will be able to work.
  - ( ) Strongly disagree
  - ( ) Disagree
  - ( ) Neutral
  - ( ) Agree
  - ( ) Strongly agree
- n. I have a strong grip.
  - ( ) Strongly disagree
  - ( ) Disagree
  - ( ) Neutral
  - ( ) Agree
  - ( ) Strongly agree
- o. I have a strong grip.
  - ( ) Strongly disagree
  - ( ) Disagree
  - ( ) Neutral
  - ( ) Agree
  - ( ) Strongly agree

29. Approximate the likelihood that the following will happen to YOU within the next 12 months:

<table>
<thead>
<tr>
<th>Problem</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
<th>80</th>
<th>90</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miss 10 or more performances due to injury.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>Be injured due to faulty props or equipment.</td>
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<td>Push yourself to your physical limits and sustain an injury.</td>
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<td>Be injured during training or exercising.</td>
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<td>Sustain an injury that was caused by the mistakes of another person involved in the show.</td>
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<td>Have an injury that requires surgery.</td>
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<td>Be severely injured from your own mistakes.</td>
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**End of Survey**

Please make sure all the appropriate pages of the survey were completed. We would appreciate your writing additional comments and questions here, or attach a separate page to the survey.

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**Thank you very much for your participation!**

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