

## Research Article

# Bedside Teaching in Australian Clinical Schools: A National Study

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*Purpose.* Bedside teaching (BST) of medical students has become less common in recent years; however, there have been strong recommendations made in the literature to continue this teaching modality for the valued benefits it provides. The purpose of the present study is to explore the perceptions and opinions of bedside teaching among senior Australian medical students. *Methods.* Medical students at Australian universities were surveyed by means of an electronic questionnaire. The results were collected and analysed. *Results.* A total of 517 responses were received from students at 15 universities and 94 different clinical sites. The percentage of students who identified BST as very important ranged from 62.5% in psychiatry to 90.4% in internal medicine. The optimal class size was nominated as 3-4 students, and students favoured a style where one individual performs a complete examination, with the remainder allowed to elicit the key sign afterwards. Students felt 3-4 hours of BST per week to be ideal. Advantages identified to BST included provision of feedback and elicitation of clinical signs. Disadvantages included time constraints and excessive class sizes. *Conclusions.* The unique benefits of BST result in its high demand by students, regardless of the discipline being taught.

## 1. Introduction

Bedside teaching (BST), defined as when a clinician supervises a group of students at the patient's bedside to elicit a history or physical signs, was once the most common form of medical student teaching [1]. It is currently, however, seen primarily as an adjunctive teaching method to classroom-based and informal teaching. Documented reasons for this include time constraints on tutors, increasing reliance on biochemical testing, medical imaging, and consultation of subspecialists [1-3]. Despite this, medical students still desire BST, and anecdotal reports have described declining amounts of this particular teaching modality and, in some centres, a total lack thereof. The opinions and perceptions of current medical students regarding this teaching modality, however, remain largely unpublished.

The present study is the largest survey of students' opinions and perceptions on BST, and it has targeted a multi-institutional population across the nation. Factors analysed

included students' opinions on optimal class size, time devoted to BST, and teaching style, as well as the importance of BST within various medical disciplines.

## 2. Methods

Ethical approval was granted by the University of New South Wales Human Research and Ethics Advisory Panel (ref: AD 11066).

*2.1. Literature Search.* Initially, the literature was reviewed. Original published studies on BST were identified by searching the Ovid Medline, EMBASE, and PubMed databases from January 1960 to July 2013. To maximise the sensitivity of the search, keywords including "bedside teaching," "students, medical," and "education, medical" were combined and included as keywords or MeSH terms. Non-English-language papers were excluded. The reference lists of all retrieved

articles were manually reviewed to identify additional potentially relevant studies.

**2.2. Questionnaire.** After reviewing the literature and identifying necessary areas of research, an anonymous voluntary survey targeting Australian medical students in the final two years of their degree was carried out by means of an electronic questionnaire. This was created using LimeSurvey (<http://www.limesurvey.org/en/>). The questionnaire was initially piloted on 94 medical students in order to test reliability and validity. The results were discarded, and a revised version of the questionnaire was posted on a freely accessible website and publicised by participating medical societies, either by inclusion in email bulletins or linked from the society website. Confidentiality was protected for all respondents, their universities, and their teaching hospitals. Participants were surveyed on the following three categories:

- (1) demographic data,
- (2) opinions—students were asked to rate the importance of BST within each discipline using Likert items, as well as providing their opinions on optimal class size, teaching regularity, and style,
- (3) free text—students were given the opportunity to comment on advantages, disadvantages, and approaches to BST and space was provided for any additional comments.

**2.3. Study Population.** Medical students in the final two years of their medical degree at any Australian university were the targeted population of this study.

**2.4. Data Extraction and Analysis.** Survey results were imported into a Microsoft Excel spreadsheet and subsequently collated and analysed by all three investigators. Incomplete responses were eliminated. Descriptive analysis was performed on the data to provide summative figures, and a narrative review of the tabulated data was performed. Statistical analysis was performed using StatsDirect (version 2.7.8, StatsDirect, Altrincham, UK). Free text responses were examined for common themes and subsequently categorised.

### 3. Results

A total of 578 students were surveyed, with 61 responses excluded as they were incomplete or provided by junior medical students. In total, 517 survey responses were included in this study, comprising students at 15 Australian universities and 94 teaching hospitals. In total, there are 19 medical schools in Australia. 62% of students who were directly contacted responded to the survey. The total number of senior medical students in Australia is 4,415; thus the survey represents 12% of the total population [4].

**3.1. Demographics.** Respondent characteristics can be seen in Table 1. The mean age of respondents was  $24.6 \pm 4.0$  years and 64% were female. Graduate students and international

TABLE 1: Respondent characteristics.

Variable	Baseline statistics ( <i>N</i> = 517) (%)
Sex	
Male	185 (36%)
Female	332 (64%)
Age	
Mean age ( $\pm$ SD)	$24.62 \pm 4.01$
Median age (interquartile range)	24 (22–25)
Domestic/international	
Domestic students	446 (86%)
International students	71 (14%)
Graduate/undergraduate	
Graduate students	199 (38%)
Undergraduate students	318 (62%)
Year level	
Third year	113 (22%)
Fourth year	166 (32%)
Fifth year	106 (21%)
Sixth year	129 (25%)
Seventh year	3 (0.005%)
Universities	15
Hospitals	94
Faculty organized BST	
Yes	396 (77%)
No	121 (23%)
Urban/regional	
Urban teaching school	408 (79%)
Regional teaching school	109 (21%)

students comprised 38% and 14% of the group, respectively, and students from regional teaching hospitals accounted for 21% of the respondents.

**3.2. Student Opinions and Perceptions.** In all disciplines, the majority of students noted BST to either be extremely or very important, supporting the notion that despite declining hours, students place a high value upon BST. 90.4% of respondents felt BST to be “very important” in the study of internal medicine, with corresponding figures of 74.1% for surgery, 79.7% for emergency medicine, 62.5% for psychiatry, 85.1% for paediatrics, and 74.1% for obstetrics and gynaecology.

**3.2.1. Optimal Class Size and Optimal Number of Hours.** A class size of two students was selected as optimal by 19.6% of respondents, 44.9% selected three students, and 28.4% selected four students with the remainder divided between five, six, and seven students. When asked to nominate the optimal number of hours per week of BST, respondents were relatively equally divided (Table 2). The mean answer was 4.1 hours.

TABLE 2: Desired hours of BST per week.

Hours per week	Percentage of respondents (%)
0	0
1	1.6
2	15.0
3	22.6
4	21.2
5	14.3
6	7.6
7 (or more)	12.8

3.2.2. *Teaching Style.* An approach where one student performs a complete physical examination and the remainder of the group elicits the key sign afterward was selected by 49.3% of respondents. This was more popular than a single student performing a complete examination (15.4%) or where the physical examination is divided into sections for students to perform one section each (30.1%).

3.3. *Free Text.* Questionnaire responses to identifying advantages and disadvantages of BST were examined for common themes. In many cases, multiple themes were identified within responses. Approximately two thirds (68.5%) of respondents noted advantages of BST. The most common benefits cited were the opportunity to receive feedback from tutors and the opportunity to practice examination technique and clinical skills. These advantages were each noted by approximately one quarter of students (see Table 3). Disadvantages were noted by 313 students with the most common disadvantage cited being excessive class size. Other common disadvantages included time constraints and the unavailability or unwillingness of patients, and they are listed in Table 4.

Respondents were given the opportunity to make additional comments on BST. A large number of respondents described BST as a valuable and enjoyable learning activity. Responses included “*bedside teaching is crucial for us to learn the appropriate skills and clinical competence. It’s also usually one of the best sessions in the week!*” and “*I learnt most of my internal medicine and paediatric knowledge from bedside tutorials and they are my strongest knowledge bases—for me this is the best way to learn.*” Further, the desire for more teaching and its notable absence were frequently expressed, for example, “*I currently believe that good bedside teaching is lacking in the course I have been offered*” and “*I wish we had more bedside teaching, it’s very practical and a good way to learn.*”

#### 4. Discussion

The present study is the first multicentre study of BST and the largest study of student opinions of BST available. The data suggested an ideal template for BST comprising 3-4 hours per week, in a class size of 3-4 students, using a format that would involve all students.

BST accounted for 75% of all teaching in the 1960s and 16% in 1978 [1]; however more recent estimates quote prevalence between 8% and 19% [3]. The relevance of BST may be

TABLE 3: Advantages of BST.

Advantages of BST	Number of respondents noting this advantage
Receiving feedback from tutors	132
Opportunity to practice examination technique/clinical skills	130
Opportunity for tutors to identify/demonstrate physical signs	104
Exposure to patients/practical experience	78
Developing clinical reasoning skills	66
Consolidation of material learnt in lectures or in textbooks	54
Simulation of exam conditions/help towards preparation for assessment	29
Opportunity to ask questions of tutors	16
Gain tips not available in textbooks	14
Developing bedside manner	8

TABLE 4: Disadvantages of BST.

Disadvantages of BST	Number of respondents noting this disadvantage
Class sizes too large	57
Time consuming for tutors	54
Patients unwilling/unavailable	52
Patient inconvenience	44
Student humiliation/intimidation/pressure	41
Unequal participation within groups	36
Variable quality of teaching	35
Difficult to organise	32

declining due to an increased reliance on medical imaging, biochemical testing [1–3], and subspecialists, [2] leading to a shift in favour of classroom based learning [5, 6]. This is an international phenomenon, with similar descriptions appearing in studies from Sudan, Saudi Arabia, the United States of America, Iran, Japan, and South Africa [7–14].

In the free text section regarding approach to BST, a common theme raised was the perceived need for consistency of teaching; for example, one student noted that “*Having a scheduled time to do bedside teaching would be optimal.*” The mode response for the optimal hours of BST was three hours per week, with a mean of 4.11 hours per week. It is clear from the data that students still place great value on this particular teaching modality. Psychiatry was seen as the discipline where BST is least useful, and even so, a majority (62.5%) of respondents felt that psychiatric BST is very or extremely important. The corresponding figure for other disciplines ranged between 74.1% and 90.4%. BST is a unique situation in which clinical skills and examination technique can be formally supervised and critiqued. Clinical signs are demonstrated, particularly those impossible to learn by textbook such as tactile (e.g., abdominal masses) and aural signs (e.g., heart murmurs).

Learning at the bedside also improves professional manners, communication skills, and questioning approaches during history taking [3, 15–17]. Furthermore, BST improves clinical reasoning and synthesis, a skill which is rarely taught elsewhere [15]. In a cross-sectional questionnaire study undertaken in Australia in 1997, it was found that 100% of respondents ( $n = 136$ ) reported BST to be the most effective way of learning clinical skills [16]. The corresponding figure in an American study was 90% ( $n = 33$ ) [3], although both of these were single institution studies. In addition to improving clinical skills, BST also provides valuable preparation for clinical exams, such as those held by the vast majority of Australian medical schools in final undergraduate examinations [17] and those required for admittance to colleges of fellowship. BST is also the best opportunity for clinical teachers to teach humanistic aspects of medical care such as empathy, respect, and compassion through role modelling at the bedside [18]. It is important to appreciate; however, that bedside teaching alone is unlikely to be sufficient for education of medical students. It is a vital component of a multidimensional, balanced medical curriculum.

The questionnaire also identified a number of barriers to successful and regular BST. A class size of three is most commonly desired by students. Overcrowded tutorials limit the participation of each student and may also increase the discomfort of both student and patient. Due to the increased throughput of hospitals, tutors are often busier with other clinical commitments, meaning diminished opportunities for BST and hence larger class sizes to accommodate all students. A feeling of “performance pressure” has also been described in the literature, where tutors feel unable to provide an adequate quality of BST due to deskilling [2, 6]. A suggestion highlighted in the study was the importance of ensuring participation of all group members, for example, “*The best approach is to involve the whole group and not just subject one individual student to open criticism in front of the patient.*”

Patients play a large role in successful BST. They may become unwilling to participate because of pain, anxiety, embarrassment, or “student fatigue,” where they are often the subject of multiple clinical examinations if they possess a rare or significant sign. Further, they may be unavailable due to procedures, consults, or imaging. While some clinicians have the misconception that BST may upset patients, the literature, however, shows that patients often enjoy being the subject of BST [19] primarily due to an improved understanding of their illness [20], and the majority welcome medical students [21].

The questionnaire data provided a number of suggestions for optimising future BST. A class size of 3–4 students, meeting for 3–4 hours per week, in a format that allowed all students in the group to elicit the key sign would be ideal to a large number of students surveyed.

Limitations to our survey do exist. As the survey was self-administered, there exists an element of self-selection. The results are specific only to Australia and cannot be applied to other countries. Despite these limitations, this is the first study of its kind in the published literature, and it provides an interesting cross-sectional view of the perceptions towards bedside teaching in Australia.

In conclusion, despite its dwindling prevalence, BST is highly valued by students for the unique benefits it provides. Areas for further research include quantification of bedside teaching and factors affecting it including geographical location, patient population and load, and hospital size and status. Similar prevalence studies may be performed in international settings to compare trends.

## Conflict of Interests

The authors declare that there is no conflict of interests regarding the publication of this paper.

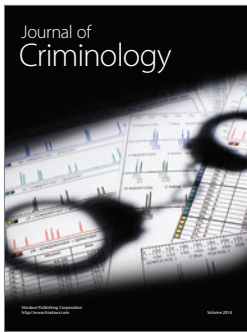
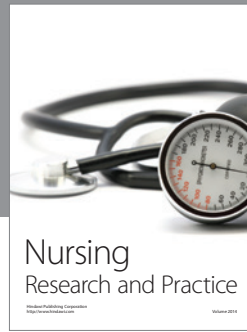
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