

## Introduction of SNAPPS as a Teaching-Learning Method for Post Graduate Students in Orthopaedics

<sup>1</sup>Dr. Ajay Sheoran; <sup>2</sup>Dr. Vasudha Dhupper; <sup>3</sup>Dr. Umesh Yadav;  
<sup>4</sup>Dr. Ashuma Sachdeva; <sup>5</sup>Dr. Chetan Prakash Agarwal; <sup>6</sup>Prashant Bajaj

Corresponding Author: **Dr Umesh Yadav**

### Abstract

**Background:** Teaching methods play a crucial role in the education and training of orthopaedics postgraduates. One innovative approach that has gained attention in recent years is the use of the SNAPPS (Summarize, Narrow down, Analyze, Probe, Plan, and Select) method.<sup>[1]</sup> However, literature on SNAPPS in orthopaedics resident training is limited, and further research is warranted to explore its specific applications and benefits in this context. **Aims and Objectives:** To introduce SNAPPS as teaching learning method in PG teaching. To study the outcomes of implementation of SNAPPS as teaching learning method in PG teaching. To study challenges in implementation of SNAPPS as teaching learning method in PG teaching. **Methodology:** This interventional educational study was conducted at the Department of Orthopaedics, PGIMS Rohtak after obtaining institutional ethical clearance. After sensitization of students and faculty members, 2 SNAPPS sessions per student were conducted. Feedback was taken at the end by students as well as faculty members. The question format included both open-ended and closed-ended questions. Rating was done on a five-point Likert scale. **Results:** 94% (n=31) Postgraduate students found SNAPPS as an effective tool to identify their learning needs while 76% students (n=25) felt confident in clinical reasoning skills after using SNAPPS. Similarly all the 18 teachers who conducted the SNAPPS sessions gave positive feedback. 83% (n=15) of them perceived that SNAPPS is an efficient way of case presentation and It helped students to acquire good clinical reasoning skills. 78 % (n=14) perceived that it helped them to identify and focus on students' weak areas. **Conclusions:** Along with traditional teaching, SNAPPS can be supplemented to improve analytical skills of the postgraduate residents. Both residents and faculty perceived SNAPPS as an effective teaching tool in outpatient teaching of PG residents.

**Key words:** SNAPPS, Orthopaedics, postgraduate teaching, Medical education

## Background

Teaching methods play a crucial role in the education and training of orthopaedics postgraduates. One innovative approach that has gained attention in recent years is the use of the SNAPPS (Summarize, Narrow down, Analyze, Probe, Plan, and Select) method.<sup>[1]</sup> However, it is important to note that the literature on SNAPPS in orthopaedics resident training is limited, and further research is warranted to explore its specific applications and benefits in this context. As a specialized field, orthopaedics requires postgraduates to possess strong clinical reasoning skills, decision-making abilities, and the capacity to handle complex patient cases. SNAPPS offers a structured and iterative approach that fosters these essential competencies.

### The structure followed in SNAPPS is as follows:

- **Summarize:** The learner starts by providing a concise summary of the patient's history and relevant information.
- **Narrow down:** The learner identifies the key issues or problems that need further exploration and analysis.
- **Analyze:** The learner analyzes the identified issues, discussing possible differential diagnoses and considering relevant aspects of the patient's presentation.
- **Probe:** This step involves probing the preceptor. The learner asks questions to the preceptor that fosters a dynamic and interactive learning environment where the preceptor provides guidance and the learner actively engages in the reasoning process.
- **Plan:** The learner outlines a plan for further investigation, tests, or interventions based on the analysis of the case.
- **Select:** The learner selects one or more hypotheses or plans and justifies their choices, integrating the information gathered.

By encouraging students to summarize patient cases, identify knowledge gaps, analyze differential diagnoses, probe their understanding through questioning, plan investigations or management, and select appropriate courses of action, SNAPPS promotes active learning and critical thinking. This method also enhances oral presentation skills, self-directed learning, and overall engagement among postgraduates. Incorporating SNAPPS into the teaching methodology at PGIMS Rohtak will empower orthopaedics postgraduates to develop the necessary skills and competencies for their future careers as well-rounded and competent orthopaedics professionals.

## Aims and Objectives

- To introduce SNAPPS as teaching learning method in PG teaching
- To study the outcomes of implementation of SNAPPS as teaching learning method in PG teaching
- To study challenges in implementation of SNAPPS as teaching learning method in PG teaching

## Methodology

**Study design:** Prospective, non-randomized, intervention study.

**Setting:** This study was conducted in the Department of Orthopaedics, PGIMS Rohtak after obtaining institutional clearance. Sensitization of faculty members and students was done using PPT and interactive discussions. A feedback questionnaire based on a 5 point Likert scale and few open ended questions was filled at the end of study.

**Participants:** Orthopaedics postgraduate students (n=33)

**Sample size:** 33 Post graduate students and 18 Teachers (12 faculty members & 6 Senior Residents) of Department of Orthopaedics.

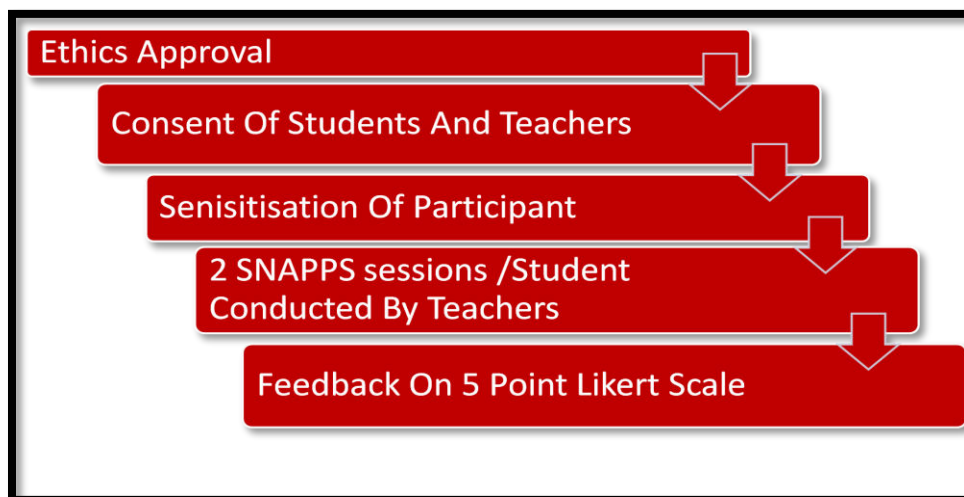
**Description of Intervention:** 2 SNAPPS sessions per student were conducted by teachers in OPD and ward. For a particular student, each session was conducted on a different topic by a different teacher. Some of the topics on which SNAPPS sessions were conducted included non union, osteomyelitis, CTEV, Knee Injury, Shoulder Dislocation etc.

After two SNAPPS sessions, the residents were asked to fill a questionnaire consisting of questions about their perception on different aspects of SNAPPS. The questionnaire was validated from PG students, teachers, and members of the medical education unit. The question format included both open-ended and closed-ended questions. Rating was done on a five-point Likert scale of 1 = “strongly disagree” to 5 = “strongly agree”. The perception of teachers about usefulness and implementation of SNAPPS as a regular teaching tool was also evaluated through a separate, validated structured questionnaire. The statistical analysis was done using SPSS (IBM SPSS Statistics 21.0; Armonk, NY, USA). The categorical variables were summarized using percentages and frequencies, and continuous data were analyzed using mean and standard deviation wherever applicable

**Study tools:** Separate feedback forms of students and teachers were used which were validated by experts. Study tools are attached as annexures.

**Data collection process:** After completion of all SNAPPS sessions, separate feedback forms of students and teachers containing open ended and close ended questions were used to collect the data.

**Ethics:** The study commenced after approval from the ethics committee of the institution. The Institution Ethics Committee letter dated 17/10/2023 number BREC/23/512 attached as annexure. Informed Consent Form and Participant Information Sheet are attached as annexure.



### Observations and results

A total of 66 SNAPPS sessions were conducted in which each resident underwent two sessions. Besides the presenter, sessions were observed by other residents and faculty available for better learning and acclimatization about SNAPPS.

### Feedback of postgraduate residents about SNAPPS

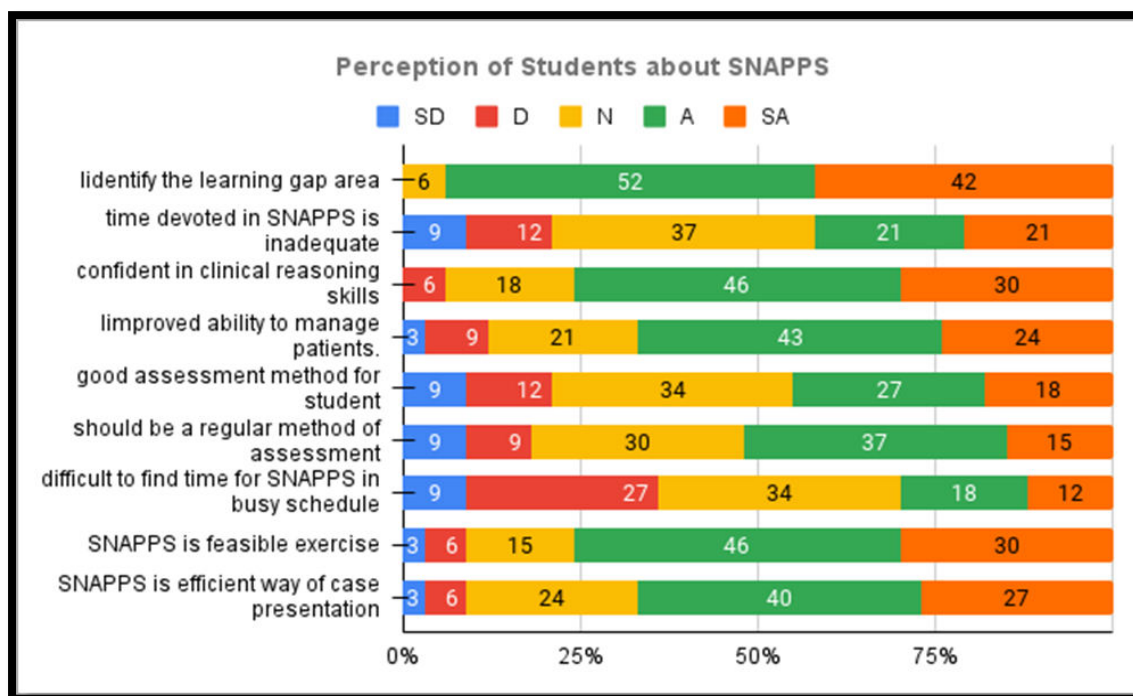
**Table 1 showing student's perception on Likert Scale after two sessions of SNAPPS**

(SD- Strongly Disagree, D- Disagree, N- Neutral, A- Agree, SA- Strongly Agree)

S. NO	Statement	n	SD	D	N	A	SA
1	It helped me to identify the learning gap area	33	-	-	2	17	14
2	The time devoted in SNAPPS teaching is inadequate	33	3	4	12	7	7
3	It made me confident in clinical reasoning skills	33	-	2	6	15	10
4	It improved my ability to manage patients.	33	1	3	7	14	8
5	It is a good assessment method for a postgraduate student	33	3	4	11	9	6
6	It should be a regular method of assessment	33	3	3	10	12	5

7	It was difficult to find time for SNAPPS in busy schedule	33	3	9	11	6	4
8	SNAPPS is feasible exercise	33	1	2	5	15	10
9	SNAPPS is efficient way of case presentation	33	1	2	8	13	9

A graphical representation of the same is depicted in figure 1 below.



**Figure 1: Perception of students about SNAPPS**

As evident in figure 1, 94% (n=31) Postgraduate students found SNAPPS as an effective tool to identify their learning needs while 76% students (n=25) felt confident in clinical reasoning skills after using SNAPPS. 42% (n=14) students felt that time devoted in SNAPPS is inadequate while 30% (n=10) found difficult to find time for SNAPPS in busy schedule. There was no consensus among the students regarding SNAPPS as a satisfactory method of assessment of postgraduate students.

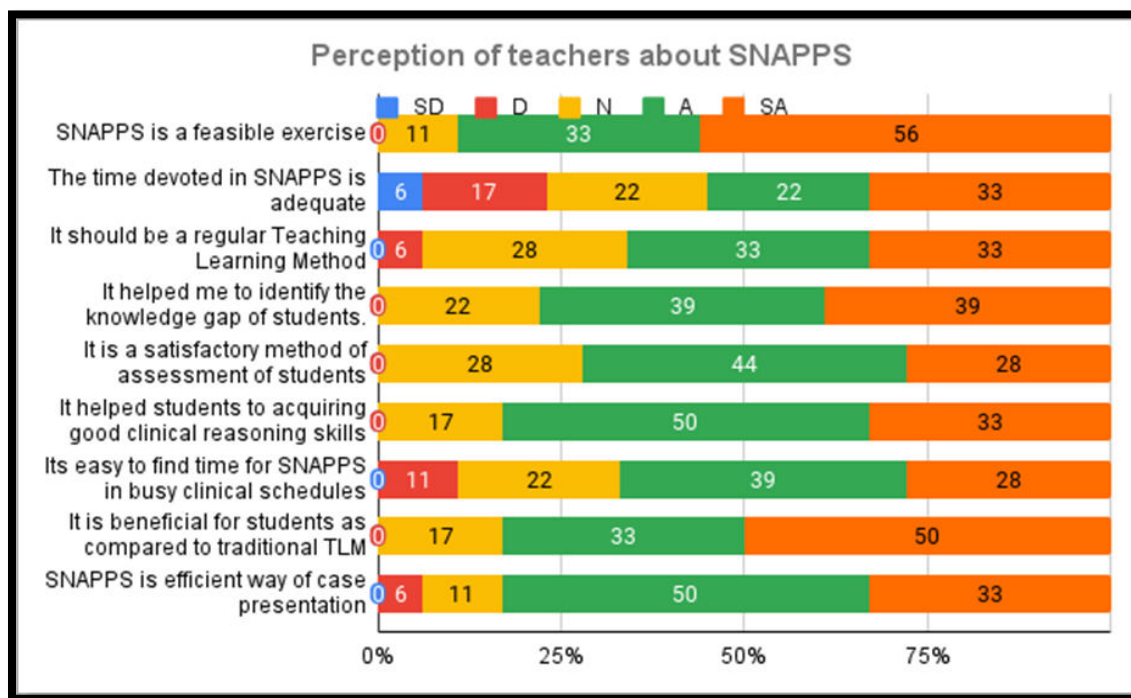
### Feedback from Teachers about SNAPPS

Total 18 Teachers (12 faculty members and 6 senior residents) participated in the feedback process and the results are displayed below:

**Table 2 showing teacher's perception on Likert Scale after two sessions of SNAPPS (SD- Strongly Disagree, D- Disagree, N- Neutral, A- Agree, SA- Strongly Agree)**

S.NO	Statement	n	SD	D	N	A	SA
1	SNAPPS is a feasible exercise	18	-	-	2	6	10
2	The time devoted in SNAPPS is adequate	18	1	3	4	4	6
3	It should be a regular Teaching Learning Method	18	-	1	5	6	6
4	It helped me to identify the knowledge gap of students.	18	-	-	4	7	7
5	It is a satisfactory method of assessment of postgraduate students	18	-	-	5	8	5
6	It helped students to acquiring good clinical reasoning skills	18	-	-		9	6
7	It's easy to find time for SNAPPS in busy clinical schedules	18	-	2	4	7	5
8	It is beneficial for students as compared to traditional TLM	18	-	-	3	6	9
9	SNAPPS is efficient way of case presentation	18	-	1	2	9	6

A graphical representation of the same is depicted in Figure 2 below



**Figure 2: Perception of teachers about SNAPPS**

All the 18 teachers who conducted the SNAPPS sessions gave positive feedback. 83% (n=15) of them perceived that SNAPPS is an efficient way of case presentation and It helped students to acquire good clinical reasoning skills. 78 % (n=14) perceived that it helped them to identify and focus on students' weak areas. 66% (n =12) advocated that SNAPPS should be incorporated as a routing teaching method for PG students. 67% of faculty members also perceived that it's easy to find time for SNAPPS in busy clinical schedules. 89% think that SNAPPS is a feasible teaching learning method for postgraduate teaching in Orthopaedics.

### Satisfaction Index

**Table 3: Satisfaction index of students feedback (n=33)**

S. NO	Statement	Satisfaction Index (%)
1	It helped me to identify the learning gap area	94
2	The time devoted in SNAPPS teaching is inadequate	42
3	It made me confident in clinical reasoning skills	76
4	It improved my ability to manage patients.	67
5	It is a good assessment method for a postgraduate student	45
6	It should be a regular method of assessment	52
7	It was difficult to find time for SNAPPS in busy schedule	30
8	SNAPPS is feasible exercise	76
9	SNAPPS is efficient way of case presentation	67

**Table 4 Satisfaction index of faculty members feedback (n=18)**

S.NO	Statement	Satisfaction Index (%)
1	SNAPPS is a feasible exercise	89
2	The time devoted in SNAPPS is adequate	55
3	It should be a regular Teaching Learning Method	66
4	It helped me to identify the knowledge gap of students.	78
5	It is a satisfactory method of assessment of postgraduate students	72



6	It helped students to acquiring good clinical reasoning skills	83
7	It's easy to find time for SNAPPS in busy clinical schedules	67
8	It is beneficial for students as compared to traditional Teaching Learning Methods	83
9	SNAPPS is efficient way of case presentation	83

The satisfaction indices of students and faculty were calculated and it was found that the satisfaction index ranged from 30% to 94% among students and 55% to 89% among faculty.

### Qualitative analysis

Open ended questions were used for qualitative analysis. However no software is used for qualitative research to identify the codes and categories but few of the themes that have been identified are as follows:

#### Advantages of SNAPPS

- Quick
- OPD teaching
- Improved clinical skills
- Student centric
- Improves critical thinking
- Enhance self directed learning
- Clarify doubts with preceptor inputs

#### Disadvantages of SNAPPS

- Short cases only
- Not useful for procedural skills
- Covers topic superficially only
- Time devoted is less

### Discussion

The present study was conducted in the Department of Orthopaedics at PGIMS Rohtak to evaluate the perception of PG residents and the teachers about SNAPPS teaching learning method in an ambulatory setting. The results showed that the residents perceived SNAPPS as an effective teaching tool in improving their clinical reasoning skills and enhancing their confidence and motivation for further study.



Our study results are consistent with various studies conducted in different clinical contexts. Feijó et al. (2022), In a study involving 26 psychiatry residents, demonstrated the effectiveness of the teaching method SNAPPS was evaluated through video analysis of psychiatric cases. Residents receiving the SNAPPS lecture demonstrated significantly higher scores compared to those receiving traditional case presentations, highlighting the method's efficacy.<sup>[2]</sup> Similarly, Seki et al. (2016), in a study with 71 junior clinical residents compared the use of SNAPPS and OMP in case presentations. The SNAPPS group exhibited significantly more units related to questions and uncertainties. Self-evaluations indicated higher satisfaction with SNAPPS in terms of ease, efficiency, sequence, and depth of case presentation.<sup>[3]</sup>

Studies across pediatric and postgraduate settings further affirm SNAPPS' versatility. Dabas et al. (2023) explored the role of faculty or senior resident-led SNAPPS in pediatrics, Postgraduate students expressed a desire for more frequent (52.9% preferred weekly) SNAPPS sessions, while preceptors favored a monthly frequency (50%), with a p-value of 0.097. Students found SNAPPS valuable for knowledge assimilation and self-directed learning, noting its structured format covering all case discussion components. Preceptors acknowledged a positive change in their attitude toward postgraduate training, with a median satisfaction score of 4.5. Senior residents also reported a positive shift in their teaching exercise attitude and postgraduate training perception due to SNAPPS.<sup>[4]</sup> Jain et al. (2019) contributed evidence through an open-labeled randomized controlled trial among 18 Medicine residents, SNAPPS training was provided through videos, role plays, and handouts. Compared to traditional case presentations, SNAPPS students demonstrated concise yet thorough patient summarization, clearer diagnostic hypotheses, and better initiation of patient management discussions, highlighting the effectiveness of SNAPPS in improving both learner and teacher development in medical education.<sup>[5]</sup>

Fagundes et al. (2020), In a randomized controlled trial with 60 medical students, compared SNAPPS and OMP for case presentations. While there was no difference in clinical reasoning expression, the SNAPPS group exhibited significantly more questions and uncertainties. Students in the SNAPPS group were more proactive in presenting and justifying diagnoses and management plans without prolonging the teaching session, emphasizing SNAPPS' effectiveness in encouraging active engagement and inquiry in medical education<sup>[6]</sup>

Collectively, these studies provide robust support for the efficacy of SNAPPS as a comprehensive teaching strategy across various medical disciplines. Its structured approach, emphasizing active learner engagement and critical thinking, makes SNAPPS a valuable tool in shaping the clinical reasoning skills of medical professionals at different stages of their training.

**Limitation of study:** Few limitations of the study include a small sample size of 33 residents & 18 teachers and being a single center study with only 2 SNAPPS sessions on PG residents, results may not be generalisable. Increasing the number of SNAPPS sessions on the residents before taking their perceptions might have ensured the authenticity of results. Third, the study did not measure long-term durability of the intervention's effects.

## Conclusion

Along with traditional teaching, SNAPPS can be supplemented to improve analytical skills of the postgraduate residents. Both residents and faculty perceived SNAPPS as an effective teaching tool in outpatient teaching of PG residents. There is favorable evidence in literature regarding usage of an effective teaching learning method. With increasing workload and busy clinical settings, SNAPPS seems to be the need of the hour.

## References

1. Wolpaw TM, Wolpaw DR, Papp KK. SNAPPS: a learner-centered model for outpatient education. *Academic Medicine*. 2003 Sep 1;78(9):893-8.
2. Feijó LP, Pereira GA, Ruffini VM, Valente FS, Santos RA, Fakhouri Filho SA, Nunes MD, Augusto KL. Effectiveness of a SNAPPS in psychiatric residents assessed using objective structured teaching encounters: a case-control study. *Sao Paulo Medical Journal*. 2022 Oct 3;141:e20211028.
3. Seki M, Otaki J, Breugelmans R, Komoda T, Nagata-Kobayashi S, Akaishi Y, Hiramoto J, Ohno I, Harada Y, Hirayama Y, Izumi M. How do case presentation teaching methods affect learning outcomes?-SNAPPS and the One-Minute preceptor. *BMC medical education*. 2016 Dec;16(1):1-7.
4. Dabas A, Mishra D, Saxena R. Faculty-or senior resident-led SNAPPS for postgraduate teaching in pediatrics. *Journal of Postgraduate Medicine*. 2023 Jan;69(1):43.
5. Jain V, Rao S, Jinadani M. Effectiveness of SNAPPS for improving clinical reasoning in postgraduates: randomized controlled trial. *BMC medical education*. 2019 Dec;19:1-8.
6. Fagundes ED, Ibiapina CC, Alvim CG, Fernandes RA, Carvalho-Filho MA, Brand PL. Case presentation methods: a randomized controlled trial of the one-minute preceptor versus SNAPPS in a controlled setting. *Perspectives on Medical Education*. 2020 Aug;9:245-50.

**Author Address:**

1. Associate Professor, Orthopaedics, PGIMS, Rohtak
2. Associate Professor, Biochemistry, PGIMS, Rohtak
3. Professor, Orthopaedics, PGIMS, Rohtak and MHPE Scholar (2024), Institute of Health Professions Education, Sri Balaji Vidyapeeth (Deemed to be University) Pondicherry, India
4. Professor, Biochemistry, PGIMS, Rohtak and MHPE Scholar (2024), Institute of Health Professions Education, Sri Balaji Vidyapeeth (Deemed to be University) Pondicherry, India
5. Junior Resident, Orthopaedics, PGIMS, Rohtak
6. Senior Resident, Orthopaedics, PGIMS, Rohtak