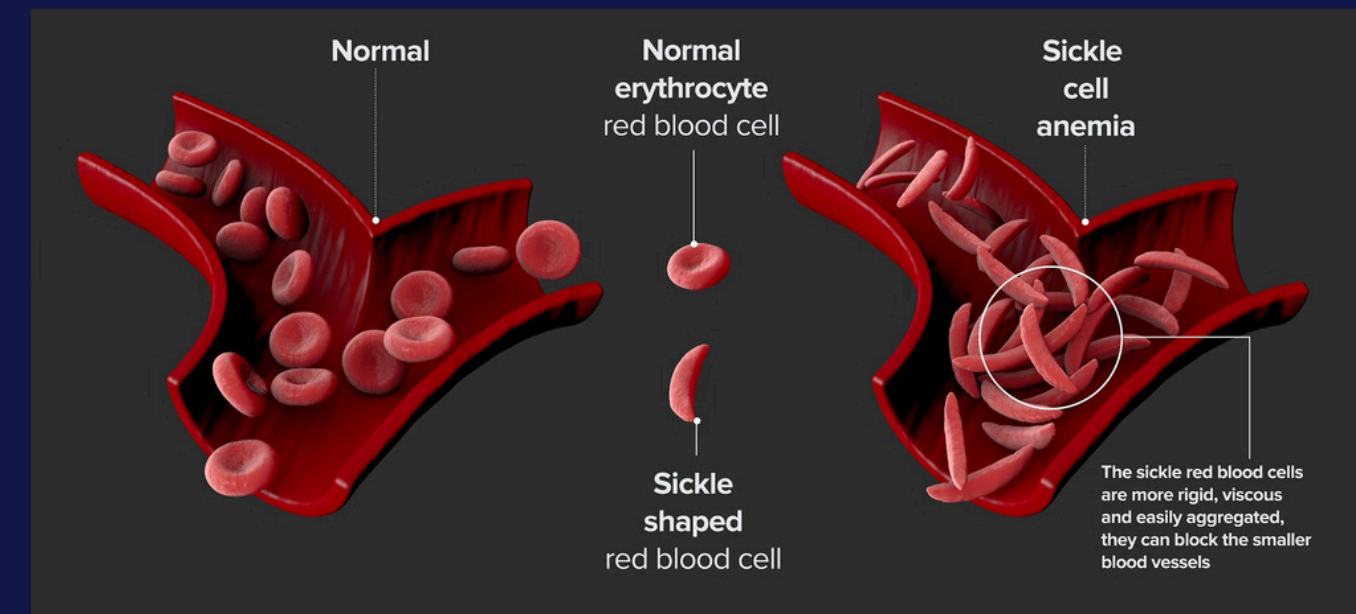
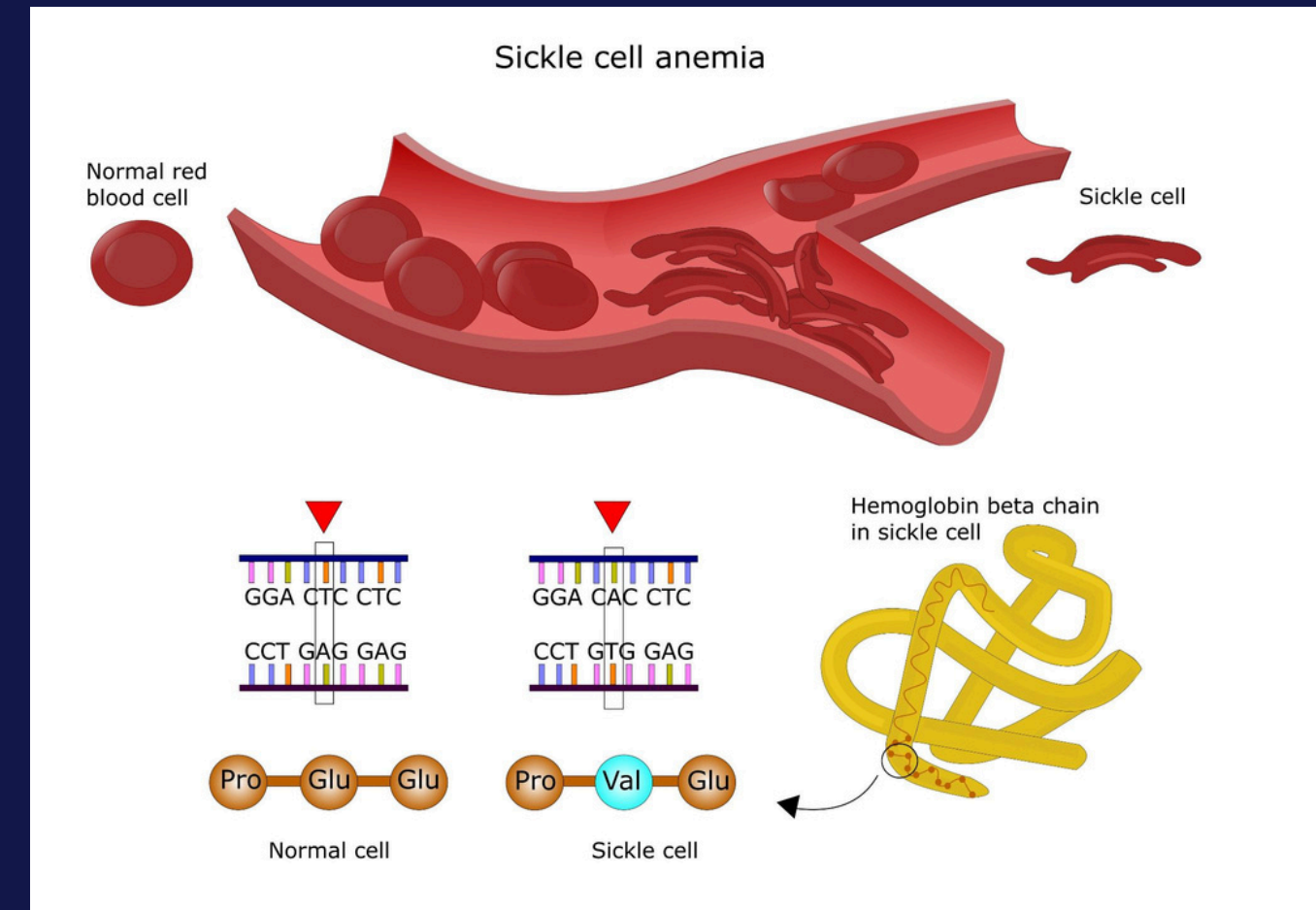


# EVALUATION OF THE NEUROPATHIC PAIN COMPONENT IN SICKLE CELL DISEASE

Maya Mohan

# INTRODUCTION

- Sickle cell disease: inherited hemoglobin disorder
- Sickle cell mutation: misshapen red blood cells, blockage of blood vessels, pain and organ damage
- Acute and Chronic Pain in sickle cell disease (Ballas 2012)
- Chronic pain: nociceptive and neuropathic
  - Nociceptive: tissue damage
  - Neuropathic: Damage or dysfunction of the nervous system
- Neuropathic pain assessment for appropriate pain targeting plan
- Pharmacological and non-pharmacological therapies and biopsychosocial approach
- Biopsychosocial model: framework recognizing biological, psychological, and social factors (Childerhose 2023)



# BACKGROUND/CONTEXT/SIGNIFICANCE

- Descriptive study: neuropathic component in adults with sickle cell disease using painDETECT questionnaire
- Transition from acute to chronic pain and variability of chronic pain not well understood (Cregan 2022)
- Management of chronic pain is therefore inadequate
- Not enough research on the prevalence of neuropathic pain and its effect on the complexity and severity of pain (Brandow 2014, Glaros 2020)
- Lack of standardized approach to identification, evaluation, and management of neuropathic pain (Brandow 2020)



# METHODS

- painDETECT questionnaire (Freynhagen 2006)
- Adults with sickle cell disease > 18 years
- Neuropathic pain screening tool: 12 questions to differentiate neuropathic vs. non-neuropathic pain
- Total score: 0 to 38
  - $\geq 19 \rightarrow$  Definitive Neuropathic Pain
  - 13 to 18  $\rightarrow$  Probable Neuropathic Pain
  - $\leq 12 \rightarrow$  No Neuropathic Pain

**painDETECT** PAIN QUESTIONNAIRE

Date: \_\_\_\_\_ Patient: Last name: \_\_\_\_\_ First name: \_\_\_\_\_

How would you assess your pain **now**, at this moment?

0 1 2 3 4 5 6 7 8 9 10  
none max.


How strong was the **strongest** pain during the past 4 weeks?

0 1 2 3 4 5 6 7 8 9 10  
none max.

How strong was the pain during the past 4 weeks **on average**?

0 1 2 3 4 5 6 7 8 9 10  
none max.

Mark the picture that best describes the course of your pain:




Persistent pain with slight fluctuations ☐

Persistent pain with pain attacks ☐

Pain attacks without pain between them ☐

Pain attacks with pain between them ☐

Please mark your main area of pain



Does your pain radiate to other regions of your body? yes ☐ no ☐

If yes, please draw the direction in which the pain radiates.

Do you suffer from a burning sensation (e.g., stinging nettles) in the marked areas?

never ☐ hardly noticed ☐ slightly ☐ moderately ☐ strongly ☐ very strongly ☐

Do you have a tingling or prickling sensation in the area of your pain (like crawling ants or electrical tingling)?

never ☐ hardly noticed ☐ slightly ☐ moderately ☐ strongly ☐ very strongly ☐

Is light touching (clothing, a blanket) in this area painful?

never ☐ hardly noticed ☐ slightly ☐ moderately ☐ strongly ☐ very strongly ☐

Do you have sudden pain attacks in the area of your pain, like electric shocks?

never ☐ hardly noticed ☐ slightly ☐ moderately ☐ strongly ☐ very strongly ☐

Is cold or heat (bath water) in this area occasionally painful?

never ☐ hardly noticed ☐ slightly ☐ moderately ☐ strongly ☐ very strongly ☐

Do you suffer from a sensation of numbness in the areas that you marked?

never ☐ hardly noticed ☐ slightly ☐ moderately ☐ strongly ☐ very strongly ☐

Does slight pressure in this area, e.g., with a finger, trigger pain?

never ☐ hardly noticed ☐ slightly ☐ moderately ☐ strongly ☐ very strongly ☐

(To be filled out by the physician)

never hardly noticed slightly moderately strongly very strongly

☐ x 0 = 0 ☐ x 1 = ☐ x 2 = ☐ x 3 = ☐ x 4 = ☐ x 5 = ☐

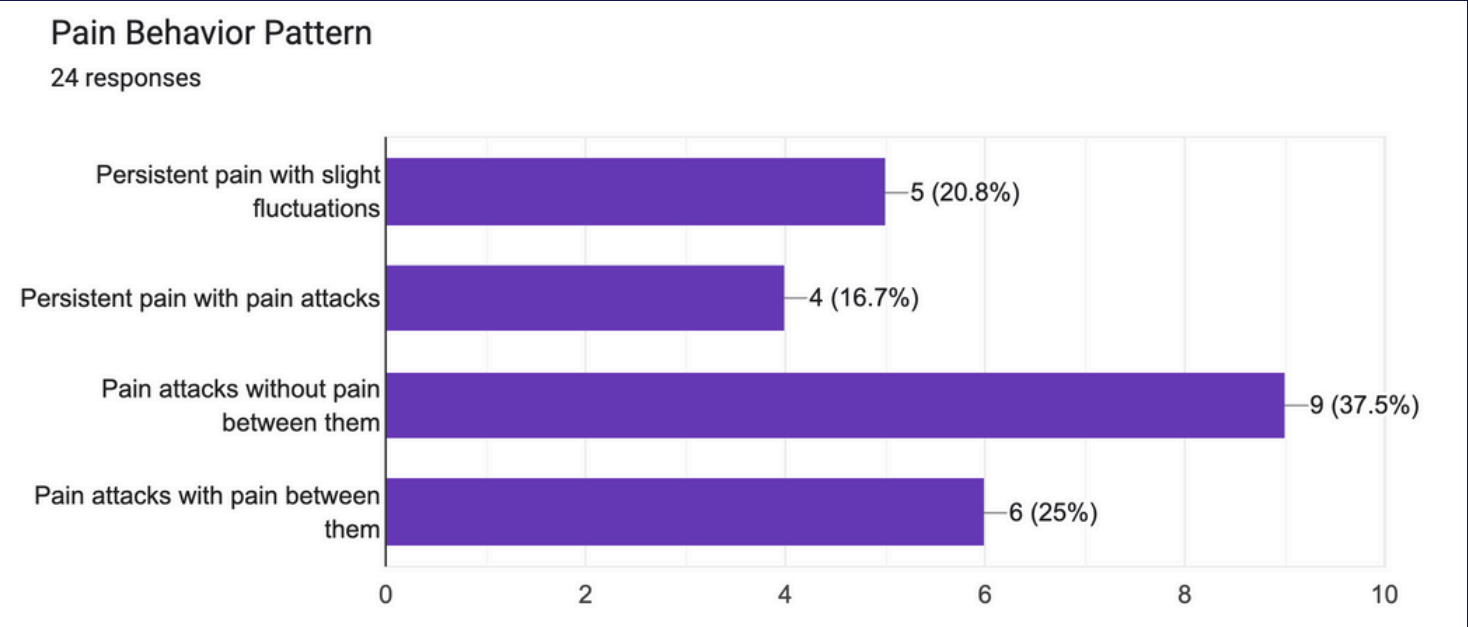
Total score  out of 35

Development/Reference: R. Freynhagen, R. Baron, U. Gockel, T.R. Tölle / Curr Med Res Opin, Vol.22, No. 10 (2006)  
painDETECT questionnaire, ©2005 Pfizer Pharma GmbH, used with permission. ©2005 Pfizer Pharma GmbH

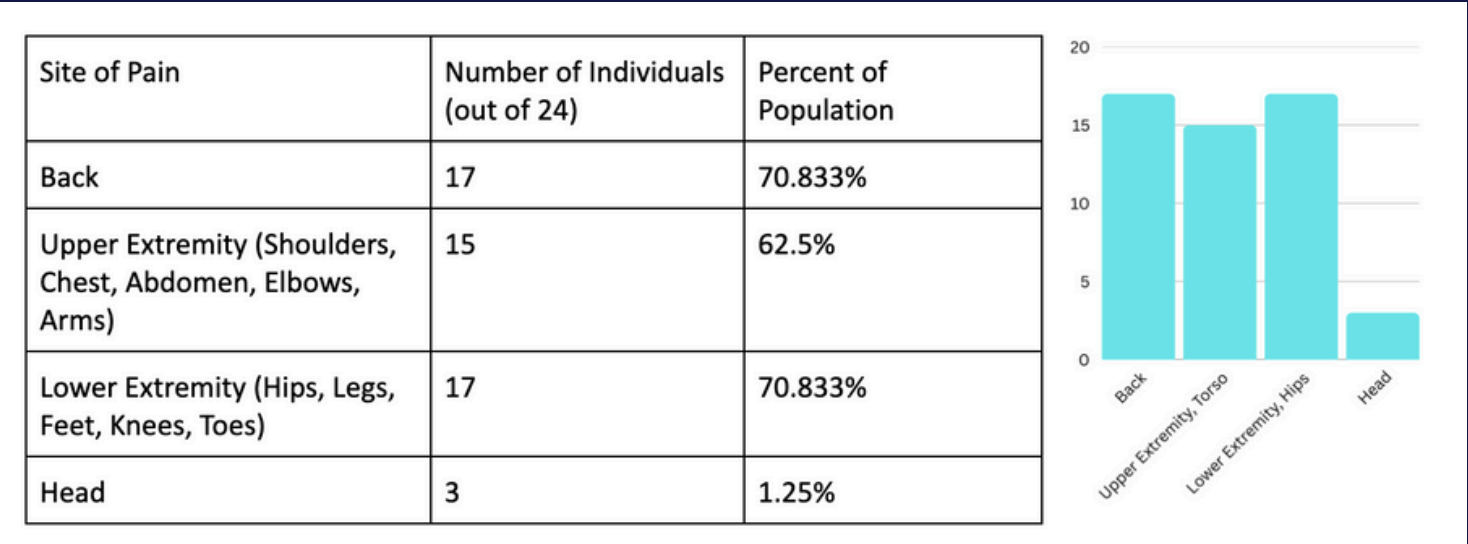
# RESULTS

- Analysis of 24 individuals with sickle cell disease
- 66.7% female, 33.3% male
- Median Age: 37 years
- Mean Pain Score
  - At the time of data collection: 5.2
  - Past 4 weeks: 6.8
  - Average strongest pain: 5.3
- 62.5%: Pain Attacks (with or without pain between them)
- 87.5%: Radiation of pain

**FIGURE I: DISTRIBUTION OF PAIN BEHAVIOR PATTERN AMONG STUDY PARTICIPANTS**



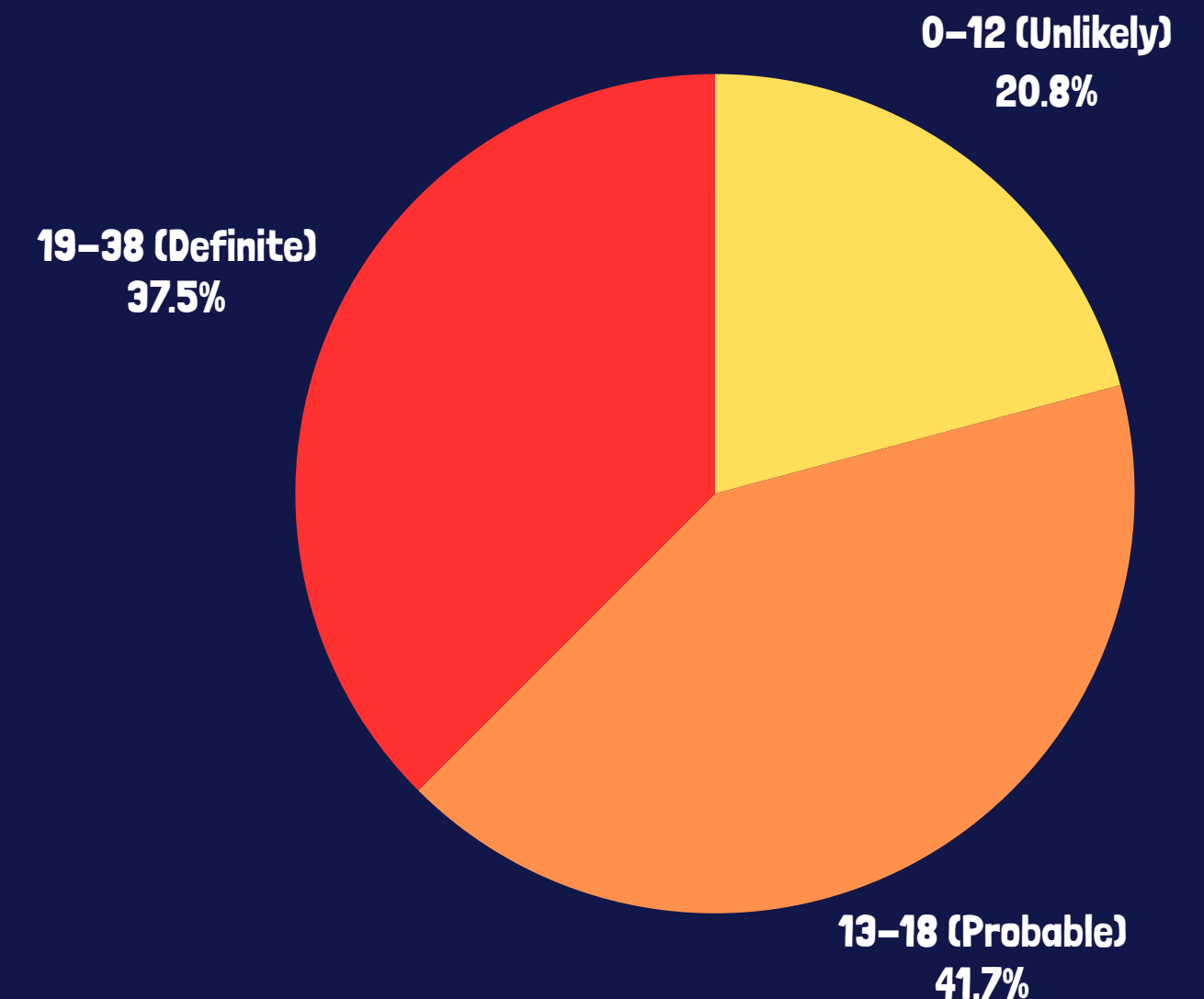
**FIGURE II: DISTRIBUTION OF SITES OF PAIN AMONG STUDY PARTICIPANTS**



# CONCLUSIONS AND ANALYSIS

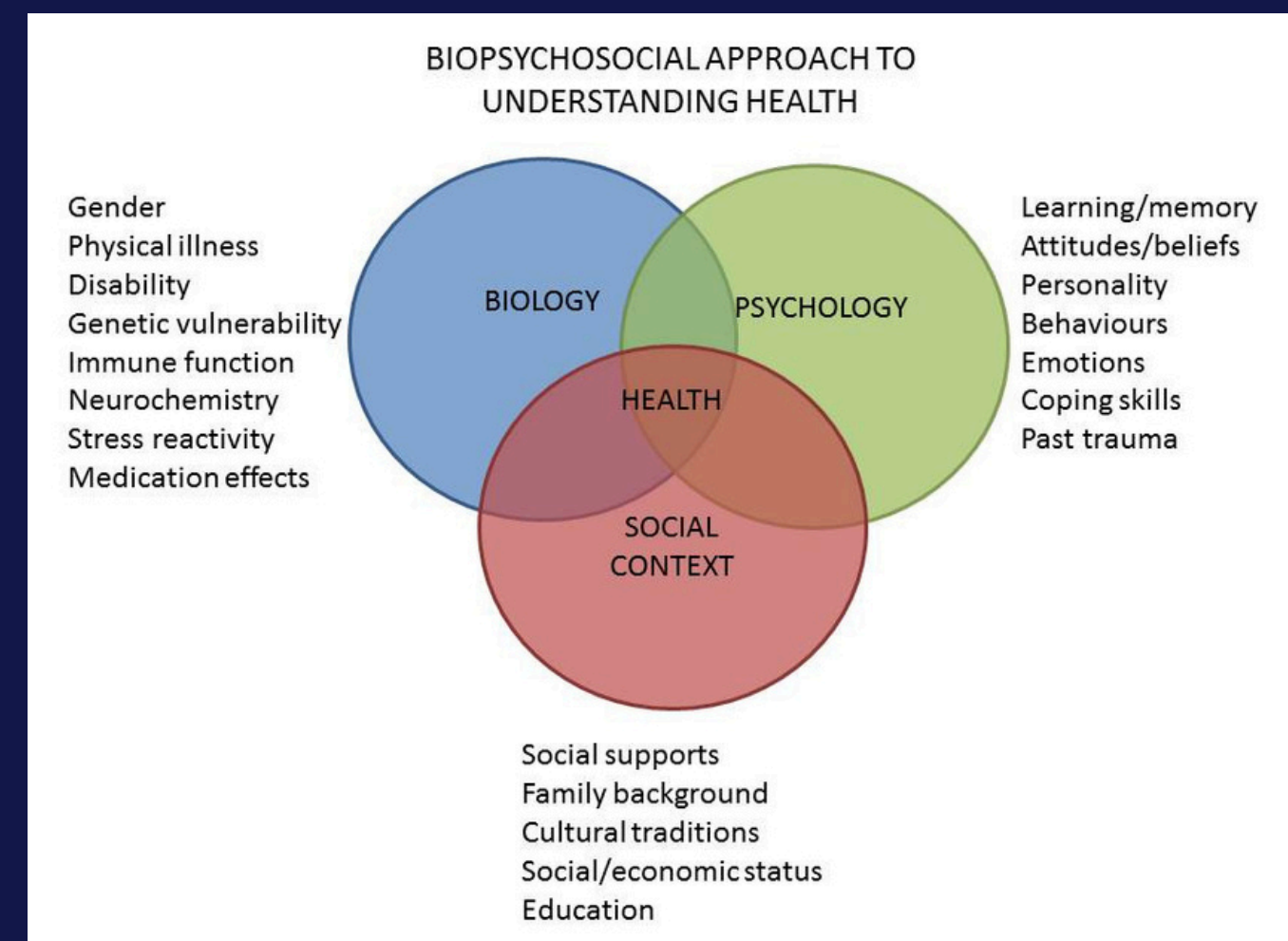
- Primary Outcome Measure
  - 79.2%: Evidence of Neuropathic Component ( $> 13$ )
  - 37.5%: Definitive Neuropathic Component ( $> 19$ )
  - 41.7%: Probable Component (13 to 18)
- Secondary Outcome Measure
  - Association between total score, age, and gender: no correlation

**FIGURE III: DISTRIBUTION OF SCORES FROM THE PAINDETECT QUESTIONNAIRE AMONG STUDY PARTICIPANTS**



# IMPLICATIONS AND NEXT STEPS

- Identification of the neuropathic component of pain can be used to help plan pain management strategies for individuals. (Brandow 2014, Brandow 2020)
- Recognition of the different component of pain will result in different pain management strategies
- Promotion of a biopsychosocial approach (Childerhose 2023) in addition to pharmacologic and non-pharmacologic therapies.

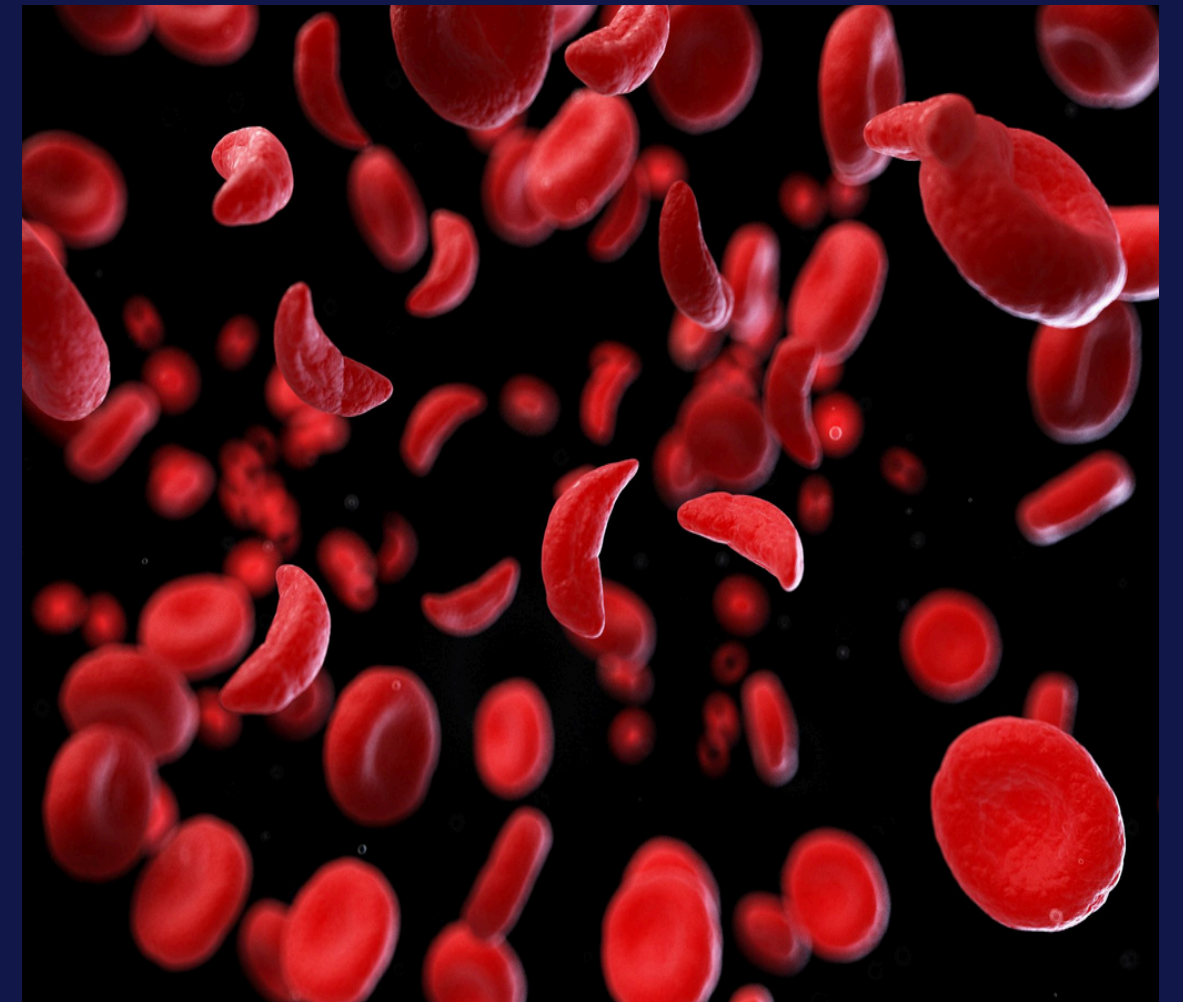


**ASPECTS OF THE BIOPSYCHOSOCIAL MODEL (ONG 2024)**



# CONCLUSION

- The optimal treatment for sickle cell disease: pharmacological, non pharmacological and integrative therapeutic interventions
- Identification of the prevalence of neuropathic pain: education, empowerment, and advocacy for individualized pain plans with chronic pain component
- Incorporation of a biopsychosocial model: recognition that biologic, neuropsychosocial and socio-environmental elements play a role in pain-related processes
- Enhancement of patient centered care for sickle cell disease





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**THANK YOU**