Based on the provided assurance case pattern using Goal Structuring Notation (GSN) and the domain-specific information about the DeepMind system, here is an instantiated assurance case for the interpretation capabilities of the machine learning model in medical imaging and diagnosis. This instantiation replaces placeholders with concrete information relevant to the DeepMind system's context.

\*\*Assurance Case for Interpretability of the DeepMind System in Medical Imaging and Diagnosis:\*\*

- \*\*G1:\*\* Interpretability Claim. The DeepMind system's ML model is sufficiently interpretable in the clinical diagnosis of retinal diseases.

- \*\*C1:\*\* The ML model comprises two neural networks; one for tissue-segmentation mapping and another for diagnosis based on segmentation maps.

- \*\*C2:\*\* "Interpretable" means that the output (segmentation map and referral) is understandable and meaningful to clinical practitioners.

- \*\*C3:\*\* Context: Clinical pathway for retinal diagnosis, primarily for retinal clinicians.

- \*\*S1:\*\* Argument based on the essential aspects of interpretability

- \*\*C4:\*\* Essential aspects of interpretability include transparency of mid-process outputs (segmentation maps) that align with clinical decision-making criteria.

- \*\*G2:\*\* Right Method. The right interpretability methods (segmentation maps and diagnosis) are implemented, ensuring that the correct information (tissue health) is faithfully being explained.

- \*\*C5:\*\* Interpretability methods include the visualization of segmented regions affecting diagnosis accuracy, directly linked to ML processes.

- \*\*S2:\*\* Argument over interpretability methods

- \*\*G8:\*\* The interpretability method (segmentation map) is the right type (local) for detailed analysis of specific areas.

- \*\*G9:\*\* The interpretability method (segmentation map) is suitably faithful to the ML model process, accurately reflecting internal model decisions.

- \*\*G3:\*\* Right Context. Interpretations produced within the clinical retinal diagnosis workflow.

- \*\*C6:\*\* Format of interpretations includes a familiar imagery format (maps) readily integrated into clinical reviews.

- \*\*G4:\*\* \[Undeveloped\] Right Format. Interpretability methods are presented in the right format (visual maps) for retinal clinicians.

- \*\*G5:\*\* \[Undeveloped\] Right Time. Interpretations produced at times crucial for decision-making, concurrent with diagnostic evaluation.

- \*\*G6:\*\* \[Undeveloped\] Right Setting. Interpretations provided in clinical settings where diagnostic decisions are made.

- \*\*G7:\*\* \[Undeveloped\] Right Audience. Interpretations specifically designed for retinal clinicians, enhancing their diagnostic capabilities.

This assurance case hierarchy represents a structured argument focusing on the interpretability of the DeepMind system, a critical feature for trust and reliability in clinical settings. Each node (goal, context, strategy) builds upon the logical flow from general interpretability claims down to specific aspects like method, context, and implementation details, ensuring the system's outputs are actionable and comprehensible for the intended users—retinal clinicians.