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BACKGROUND

- Retinopathy of prematurity (ROP) is a vision-threatening disease associated with abnormal retinal vascular development that occurs only in preterm infants born with low birth weight (BW) of below 1500 g and/or before 31 weeks of gestational age (GA)^[1].
- Although ROP can be prevented and treated^[2], it is still a leading cause of childhood blindness in developed and developing countries^[3].

OBJECTIVE

- The objective of this targeted literature review was to collect data and describe the prevalence and incidence of ROP in Europe.

METHODS

- The Medline, Embase, and the Cochrane Library databases were searched using disease-specific search terms and keywords for outcomes of interest from database inception to January 2019.
- Search results were limited to English language.

Selection of studies

- Abstracts of all identified studies were screened for relevance, followed by a full-text evaluation for inclusion based on predefined criteria presented in **Table 1**.
- Studies reporting on the epidemiology of any form of ROP or severe ROP were included.

Table 1. Literature review methodology

Sources	
Databases	MEDLINE® and Embase® via Embase.com MEDLINE In-process and Cochrane via OvidSP Orphanet rare diseases platform
Population	Patients with ROP
Interventions	Not applicable
Comparator	Not applicable
Key inclusion criteria	
Outcomes	Epidemiology (prevalence and incidence) of any or severe form of ROP
Study design	Population based epidemiology studies Prospective or retrospective observational studies reporting ROP
Language	English
Publication date	Database inception to January 2019
ROP, retinopathy of prematurity	

RESULTS

- In total, 25 studies from 40 publications were identified for final inclusion in this study.

ROP and Visual Impairment

- Globally, 20,000 infants are estimated to progress to severe visual impairment or blindness from ROP, and a further 12,300 are left with mild or moderate visual impairment^[3, 4].
- Blencowe and others have estimated that, in 2010, preterm survivors who suffered from long-term visual impairment related to ROP ranged between 24,800 and 44,500^[3].
- Data on the prevalence of ROP are often inconsistent and vary between countries. Various factors like preterm birth rates, preterm infants survival rate, quality of the neonatal care services and availability of timely screening and treatment for at-risk infants often impact study results^[5].

Incidence of ROP

Incidence of any stage ROP

- Literature findings for Europe indicated that incidence rates for any stage of ROP for infants with low BW (≤1500 g) and/or low GA (<32 weeks) varied between 9% in Switzerland and 42% in the United Kingdom (UK) (**Figure 1**).
- On the other hand, an Italian study reported the incidence of ROP to be 62.9% for infants born with a very low BW ≤750 g and/or GA ≤27 weeks^[6].
- The incidence of >stage 2 ROP in a Danish national study in infants with BW <1000 g and/or GA <28 weeks was reported as 4%^[7].
- The Royal National Institute of Blind People (RNIB) in the UK reported that approximately 65% of infants with BW <1251 g will have ROP, of which only 6% will have stage 3–5 ROP requiring treatment^{t[8]}.

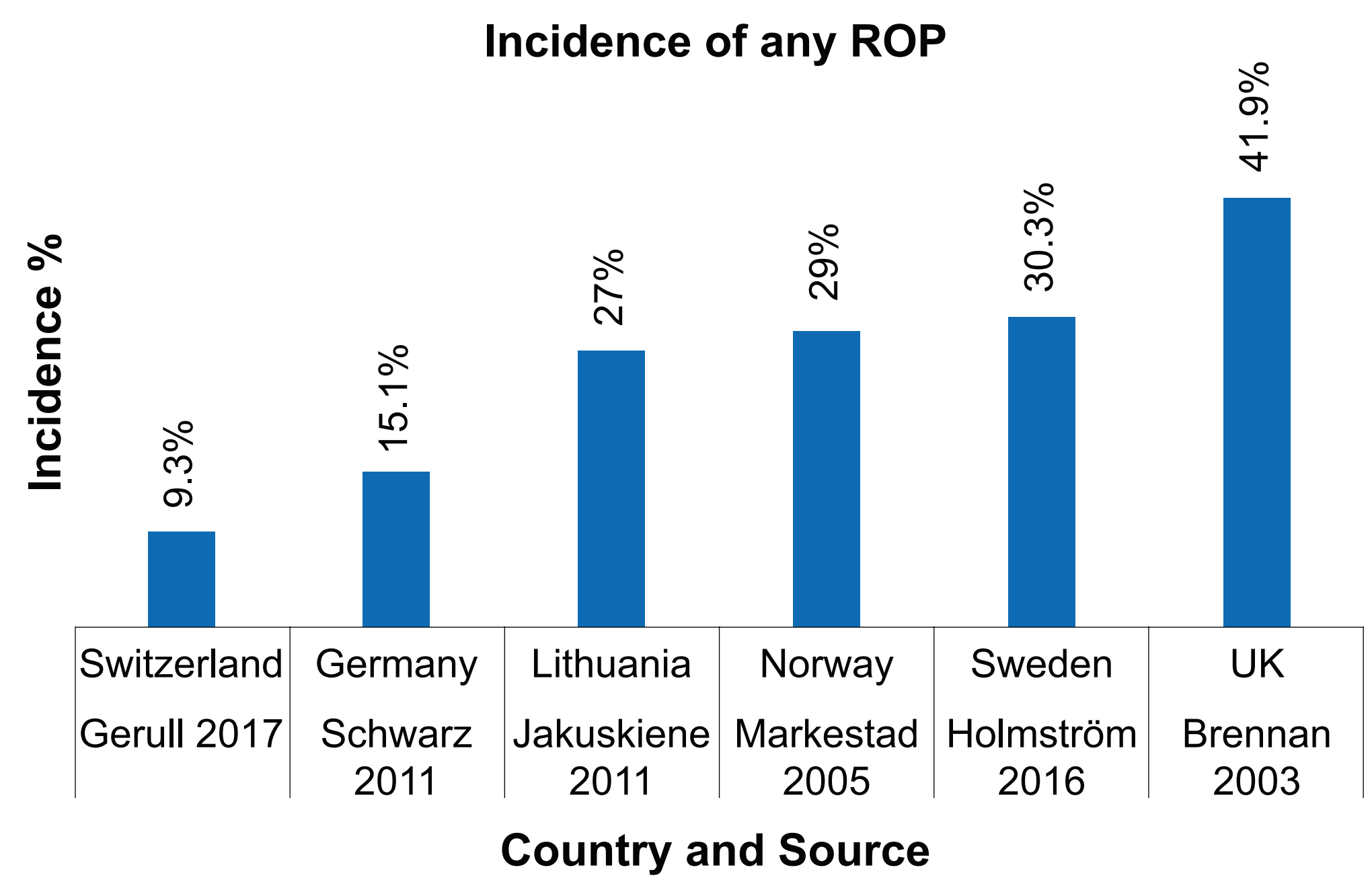


Figure 1. Incidence of any stage ROP

Source: Germany^[9], Lithuania^[10], Norway^[11], Sweden^[12], Switzerland^[13], UK^[14]
Note: These studies had infants with low BW (≤1500 g) and/or low GA (<32 weeks)
ROP, retinopathy of prematurity; UK, United Kingdom

Incidence of severe or ≥stage 3 ROP

- Depending on the country, study design, and methodology, incidence rates for severe or ≥stage 3 ROP varied between 2% and 35% in Switzerland and Sweden, respectively. These patients had low BW <1500 g and/ or GA of between 22 and 32 weeks (**Figure 2**).

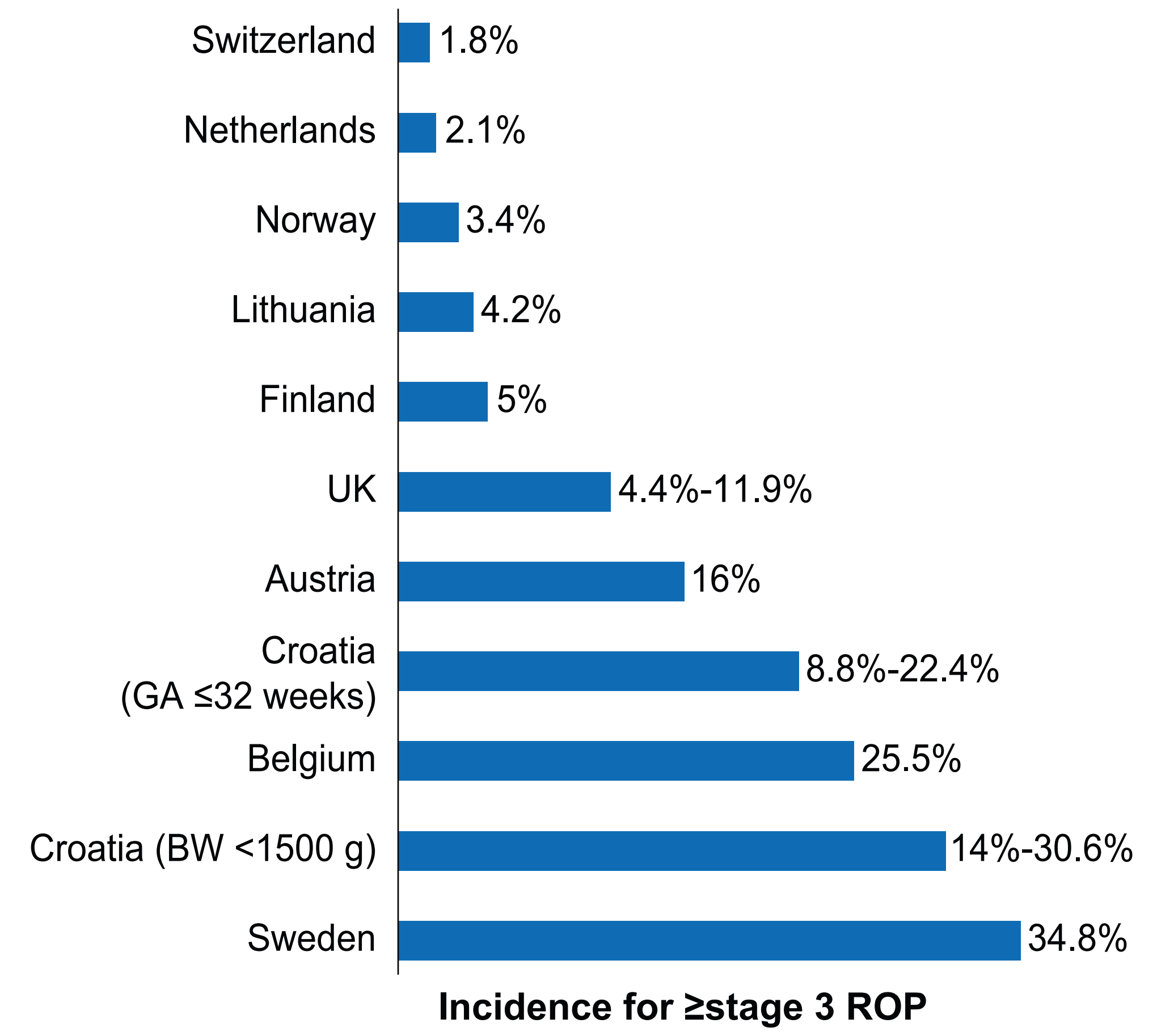


Figure 2. Incidence rates for severe or ≥stage 3 ROP

Source: Austria^[15], Belgium^[16], Croatia^[17], Finland^[18], Lithuania^[10], Netherlands^[19], Norway^[20], Sweden^[21], Switzerland^[13], UK^[22]
Note: These studies had infants with low BW (≤1500 g) and/or and/ or GA of 22 to 32 weeks
BW, birth weight; GA, gestational age; UK, United Kingdom

Trends in the Incidence of ROP

- The incidence and severity of ROP increase with the degree of prematurity at birth, with low GA and low BW being the main risk factors^[1, 23].

- The incidence increases in highly developed countries, presumably due to the availability of better neonatal care and increased preterm infant survival rate^[24-27].
- The studies below have reported an increase of ROP incidence rates in the UK and the Nordic countries in recent years:
 - A longitudinal study of the English National Hospital Episode Statistics database reported a 10-fold increase in the incidence of ROP among low BW infants (<1,500 g) from 12.8 per 1,000 in 1990 to 125.5 in 2011^[27].
 - In Denmark, a study reported that the incidence of ROP treatment has more than doubled during the 10-year study period from 1996 (1.3%) to 2005 (3.5%)^[28].
 - A Swedish national registry study also found an increase in the ROP incidence rates over 8 years during 2008 to 2015 ^[29].

CONCLUSIONS

- The evidence on prevalence and incidence of ROP varies considerably in Europe, reflecting the differences in screening criteria, neonatal care and population heterogeneity. Some risk factors are well established (GA, BW), but there is no clear consensus about the others.
- As this is a vulnerable population, more understanding is needed to ensure appropriate treatment to limit the long-term negative impact of ROP.

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Disclosures

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